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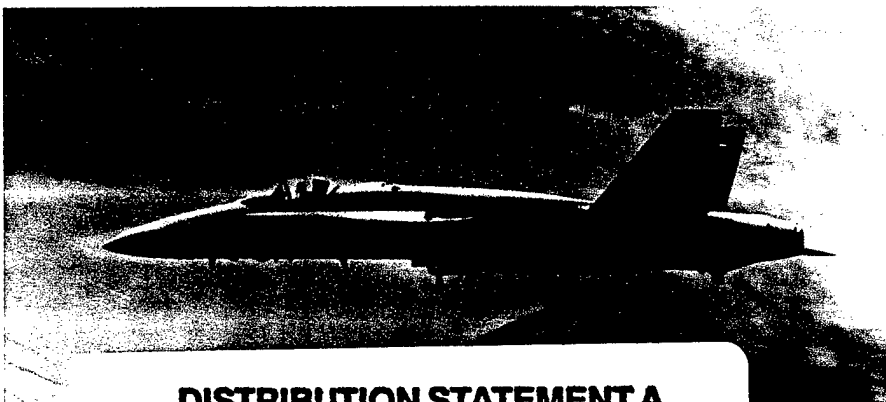


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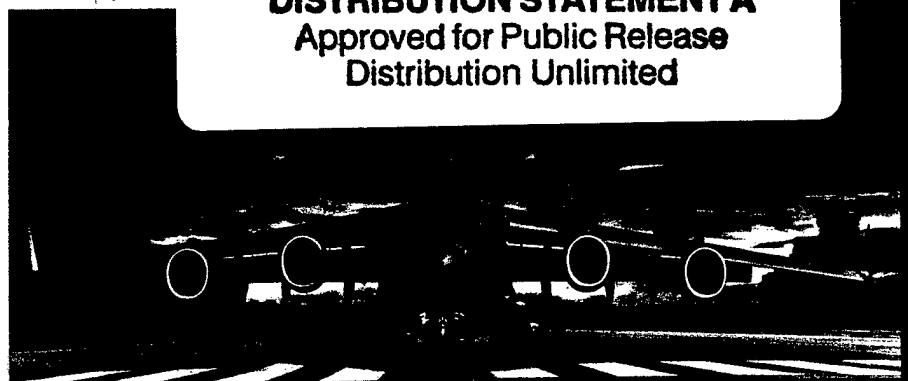
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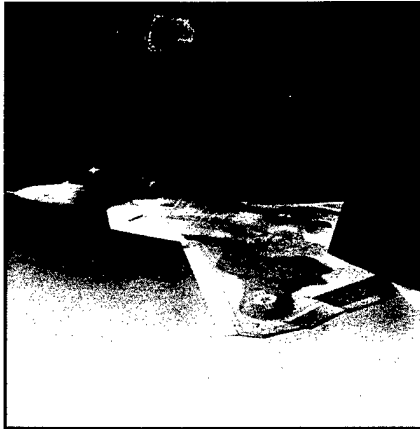
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*Applying Best Practices to Weapon Systems
Takes the Right Environment*

PROGRAM MANAGER

Vol XXIX, No.1, DSMC 154



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Applying Best Practices to Weapon Systems Takes the Right Environment

Katherine Schinasi • Paul Francis • Michael Sullivan • Marvin Bonner • Gordon Lusby • Maria Santos • Charles Cannon

Creating the incentives — reasons why best practices will work for program managers.

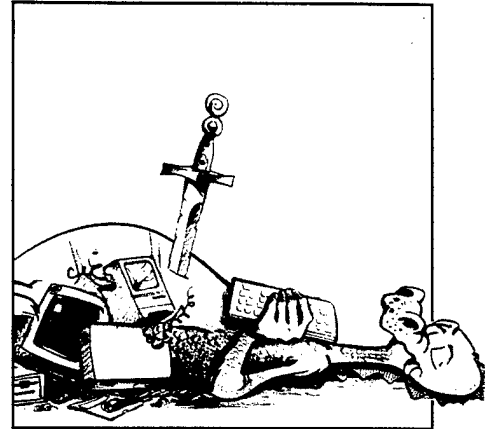


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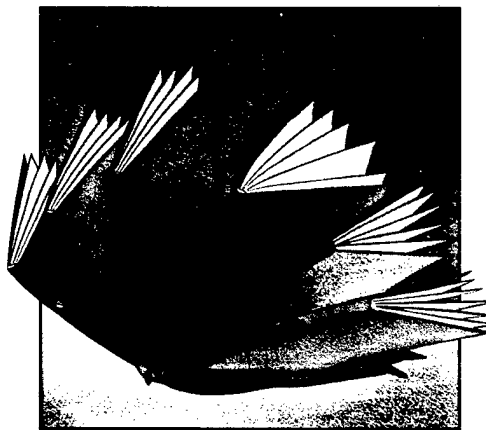


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Applying Best Practices to Weapon Systems Takes the Right Environment

Creating the Incentives — Reasons Why Best Practices Will Work for Program Managers

KATHERINE SCHINASI • PAUL FRANCIS • MICHAEL SULLIVAN
MARVIN BONNER • GORDON LUSBY • MARIA SANTOS
CHARLES CANNON

The Department of Defense (DoD) plans to increase its investment in new weapons to about \$60 billion in fiscal year 2001 — a 40-percent increase over fiscal year 1997. DoD has high expectations from this investment: that new weapons will be better and less expensive than their predecessors and will be developed in half the time. With its traditional management approach — which produces superior weapons, but at much greater cost and time than planned — DoD will not meet these expectations. However, current practices employed by some leading commercial firms to reduce cost and schedule during development of new products — by as much as 50 percent — can illuminate ways for DoD to make similar improvements.

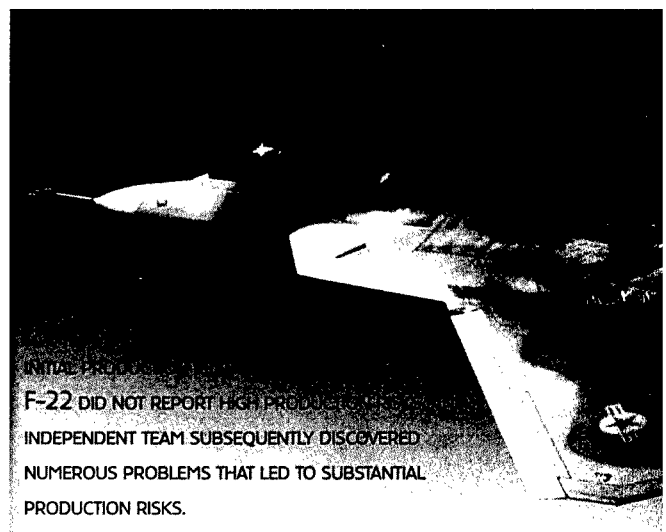
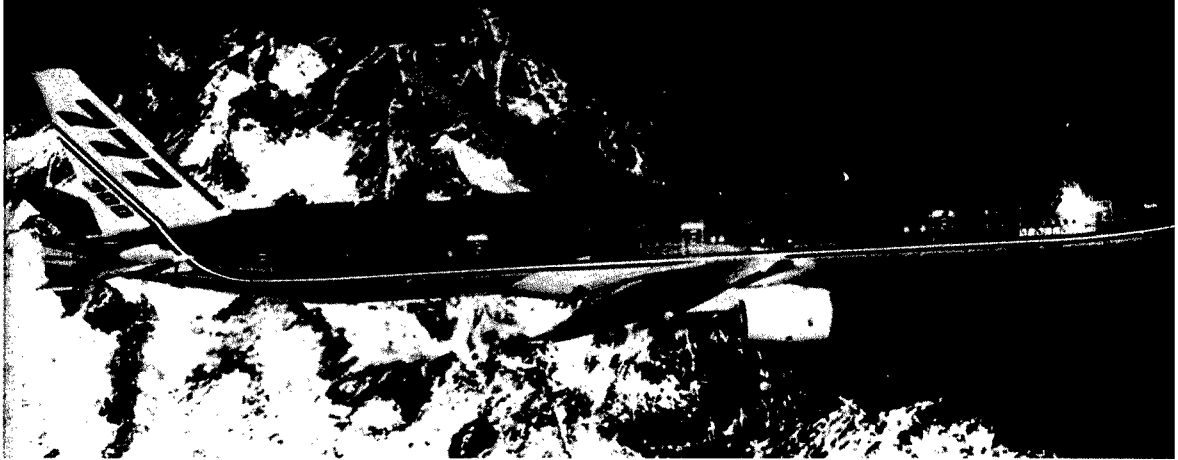
Elemental Step — Changing the Environment and Incentives

Although Congress can help set and reinforce incentives for DoD to complete

programs within cost and schedule, the ability to do so falls squarely within the province of DoD's acquisition practices. Acquiring weapons more quickly and less expensively that will still defeat the threat will require different incentives for

managing programs within cost and schedule estimates. The best commercial companies succeed in these areas by providing a development environment that rewards early attainment of knowledge, matures technology before

BOEING 777 AIRLINER. IN MATCHING REQUIREMENTS TO MATURE TECHNOLOGIES, BOEING DECIDED AGAINST USING A NEW ALLOY ON THE 777.



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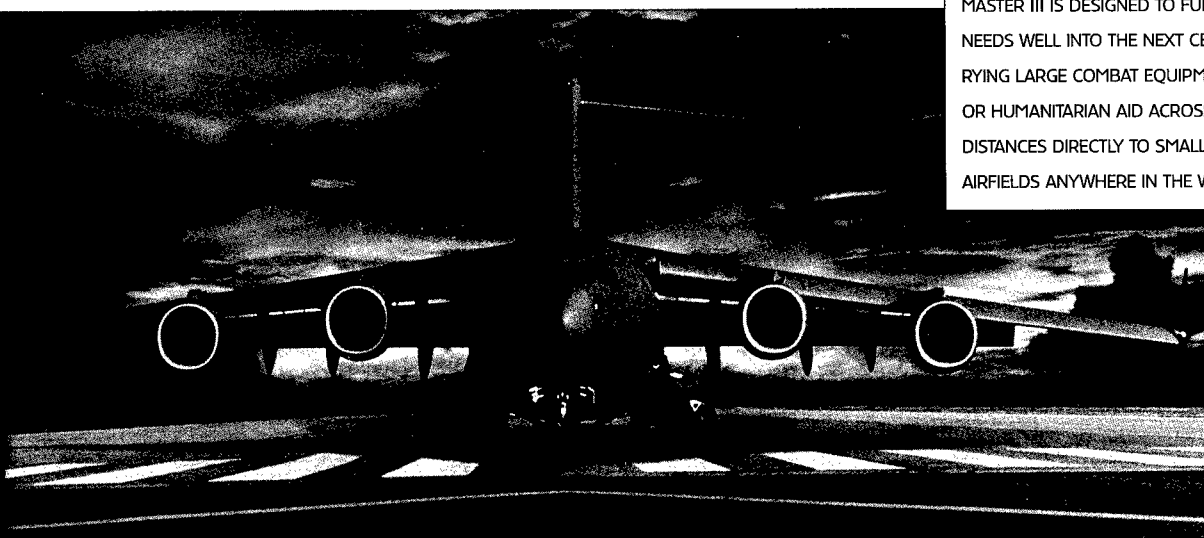
it is incorporated into new products, and keeps product development focused on design and production concerns.

This article highlights observations and relevant acquisition information from the General Accounting Office's (GAO) work in examining best practices within DoD and the commercial world. We found clear differences in the practices

of leading commercial firms and those of DoD weapon programs. We also found that the way success and failure are defined for commercial and defense programs differs considerably, which creates a different set of incentives for the people managing the programs. Thus, the practices that work — that help a program succeed — in the commercial sector will not automatically work in the de-

practices offer ways to improve DoD's practices for developing weapon systems.² Our studies also examined how differences between commercial and DoD environments affect their ability to employ practices for developing new products.

C-17 GLOBEMASTER III. THE U.S. AIR FORCE/McDONNELL DOUGLAS C-17 GLOBEMASTER III IS DESIGNED TO FULFILL AIRLIFT NEEDS WELL INTO THE NEXT CENTURY — CARRYING LARGE COMBAT EQUIPMENT AND TROOPS OR HUMANITARIAN AID ACROSS INTERNATIONAL DISTANCES DIRECTLY TO SMALL AUSTERE AIRFIELDS ANYWHERE IN THE WORLD.



fense sector. However, to buy weapons better, faster, and cheaper, DoD needs these practices. Changing the environment and incentives for programs is the elemental step.

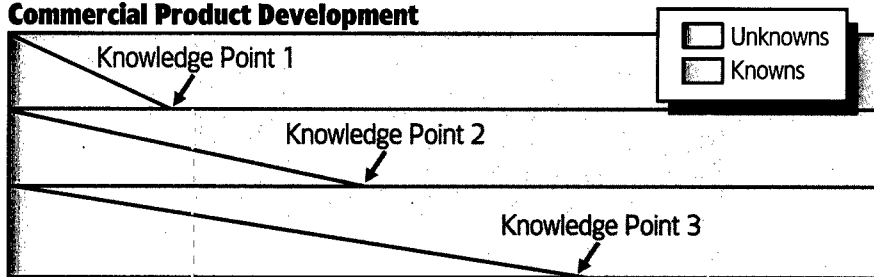
What We Did and Why

At the request of the Senate Armed Services Subcommittee on Acquisition and Technology,¹ GAO completed studies in 1998 and 1999 that assessed whether best commercial

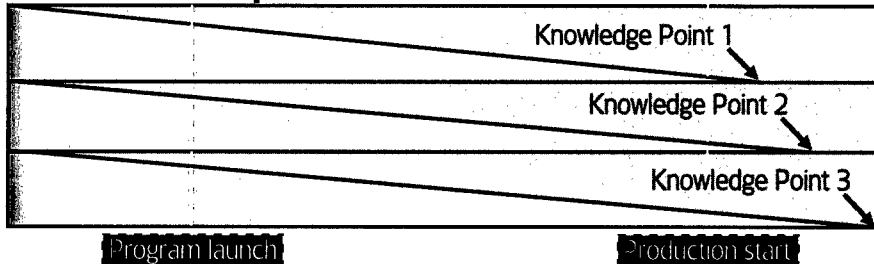
Our first step was to analyze RAND's database of over 200 Selected Acquisition Reports compiled since the 1960s to determine historical cost and schedule patterns for DoD acquisitions. We found a consistent pattern of cost and schedule increases in acquisitions as they transitioned from development to production. We then gathered information from two major DoD programs, the C-17 and the F-22, and from two newer programs, the AIM-9X Sidewinder Mis-

Comparison of Three Key Knowledge Points for Commercial and Military Product Developments

Commercial Product Development



DoD Product Development



Knowledge Point 1: Knowledge that a match exists between technology and requirements.
 Knowledge Point 2: Knowledge that the design will work as required.
 Knowledge Point 3: Knowledge that the design can be produced.

and the Joint Direct Attack Munition (JDAM).

We also visited six commercial firms with proven track records for innovative and successful product development practices: Boeing Commercial Airplane Group, Chrysler Corporation, Cummins Engine Company, Ford Motor Company, Honda Motor Company, and Hughes Space and Communications. These firms reduced the cost and cycle time for developing new and better products.

Continuing our efforts, we visited each DoD program and gathered data about the types of information on hand at key junctures during the development phases of the program. This included new technologies needed to achieve performance characteristics, engineering drawings released at critical design review points, and the extent to which key manufacturing processes were in control as the transition to production began. We gathered similar data from each commercial company.

Significant cultural differences that drove behaviors between the two sectors became apparent early in our study. For example, commercial managers tended

to focus on production and the successful sale of the end product, while DoD managers tended to focus more on the next milestone review. To commercial program managers, the development cycle times for weapon system programs – on the order of 15 years – seemed almost like a foreign language. One program manager remarked that it was his experience that people developing new products cannot truly focus on a goal that is more than five years away.

Attaining Key Product Knowledge Early Critical to Program Success

The successful management of cost, schedule, and performance risk in developing a product is tied to how soon the program team attains full knowledge about key dimensions of the product. Knowledge means that program managers and decision makers have reached virtual certainty about an aspect of the product being developed such as a critical manufacturing process. In essence, knowledge is the inverse of risk. Regardless of the product being developed, at some point in the process the program team attains full knowledge about all aspects of that product. Similarly, we found the level of knowledge that most signif-

icantly affects program outcomes converges at three critical points:

- When a match is made between the customer's requirements and available technology.
- When the product's design is determined to be capable of meeting performance requirements.
- When the product is determined to be producible within cost, schedule, and quality targets.

The chart on the left illustrates these three knowledge points and the differences between the commercial best practices we observed and the practices of the C-17 and F-22 programs.

As can be seen, the successful commercial firms gained more knowledge sooner about a product's ability to meet customer needs, performance, and producibility. On the other hand, the practices employed on the F-22 and C-17 programs allowed key knowledge about all three product dimensions to be deferred until much later in development – and even into production. As a result, discovery and resolution of unknowns (for example, the maturity of key technologies and ability of the design to work) continued, even as the program team was trying to concentrate on production concerns.

As production approaches, the difficulties and surprises associated with gaining such critical knowledge late in development invite the discovery of problems and attendant cost and schedule perturbations. Tracing program progress through the three knowledge points will not only show the differences in how the practices are employed, but also the potential for recognizing risk – in the form of absent knowledge – early in a program.

Knowledge Point 1

A match exists between available technology and product requirements. (Indicator: Product requirements can be met without depending on immature technology.)

Leading commercial firms will not launch a new product development un-

less they have high confidence that a match is reached between what the customer wants and what the firms can deliver. Critical to getting this match is the firms' practice of keeping technology development from mixing with product development. They do, in fact, fund and take risks with new technologies, but not on a product they have committed to develop and manufacture for customers. They take their technology risks off line, and demand a high level of maturity before a technology can graduate onto a product development. For example, Hughes waited 10 years for the requisite solar cell technology and the industrial base to mature before developing a new class of satellites with this technology.

Maturity is defined by proof that the technology will work and can be produced at an acceptable cost, on schedule, and with high quality. To get the match between product requirements and available technology, the companies bring solid technological knowledge to the requirements process in the form of current, high-fidelity information from predecessor programs, people with first-hand experience on those programs, or new technologies that have been proven mature.

The DoD programs we reviewed did not attain a match between technology and requirements at the time of launch. Unlike commercial products, substantial technology development takes place on weapon system programs. In fact, in the acquisition cycle, a weapon system program is launched *during* technology development. DoD accepted varying — but consistently higher — degrees of technological risk on the four programs we reviewed. Although the potential for available technology to meet product re-

quirements is examined in DoD programs, requirements are allowed to drive technology and reach beyond what is proven.

For example, although the C-17 was developed using mostly nondevelopmental items or commercial parts, its use of aluminum lithium — a new and unproven technology that held promise for reducing weight on the aircraft — proved regrettable. It was used on the first 50 aircraft produced, only to lack in dura-

dled in the manufacturing facilities. The alloy was rejected for the 777 on the strength of these unknowns.

Knowledge Point 2

The design will work. (Indicator: Percent of engineering drawings available at critical design review.)

The completion of engineering drawings and their release to manufacturing signify that program managers are confident in their knowledge that the design performs acceptably and can be considered mature. Both DoD and commercial firms consider a design to be complete when about 90 percent of the engineering drawings are completed. Both sectors schedule a critical design review (CDR) to review the drawings, confirm the design is mature, and "freeze" it to limit alterations later in the process.

The commercial firms we visited had released over 90 percent of their products' engineering drawings by the time of the CDR, which was held about midway through development. Very few design alterations were allowed after the CDR even when this freeze raised program costs, because the risk associated with major design changes was

seen as too large. A good example of this was on Boeing's 777 program. Early in the requirements-setting process, one airline indicated that it wanted folding wingtips to move the airplanes in and out of hangars of different sizes. Boeing accommodated this in the design by building in a bulkhead to accommodate a hinge in the wingtip — a feature that added weight to the aircraft. Later, when the customer did not need the fold-up feature, Boeing left the bulkhead in the design and absorbed the weight penalty

DoD managers see the acquisition of the weapons under their purview as aligned with national interests. They do what they believe is right, given the pressures they face. The difference is that the definition of program success determines what is right, and that definition differs in the [defense and commercial] sectors.

bility and maintainability. Aluminum lithium is now being removed in favor of a more proven alloy.

What piqued our interest in this example was the fact that about the same time the decision was made to include aluminum lithium on the C-17, Boeing decided against using it on the 777. Although the alloy's light weight was highly desirable as a way to lighten the airliner, manufacturing managers argued that not enough was known about its longevity and how it needed to be han-

rather than run the risk of a redesign after the design had been proven.

CDRs were also held on the C-17 and F-22 programs midway through development. However, at the time only 56 percent of the C-17 drawings were done, and less than one-third of the F-22's drawings were done. The C-17 did not get to the 90-percent drawing release level until after several production aircraft had been delivered. In the time between the CDR and production, several technical problems occurred during C-17 testing that resulted in re-designs, cost increases, and schedule delays. For example, flight-testing revealed that the wing could not meet requirements and needed a major redesign.

Knowledge Point 3

Production units will meet cost, schedule, and quality objectives. (Indicator: Key processes under statistical control.)

The companies we visited attained the knowledge that manufacturing processes would produce a new product conforming to cost, quality, and schedule targets *before* production began. This meant more than knowing the product could be manufactured; it meant that all key manufacturing processes were under statistical process control, such that the quality, volume, and cost of their output were proven acceptable. The C-17 and F-22 DoD programs demanded less proof of producibility before approving production. For example, only 13 percent of the C-17's key processes were under statistical process control when it began production in 1989, and seven years later all key processes were still not under control. The F-22 was faring better, having reported about 40 percent of its processes under control two years before production. JDAM reported promising results, with about 69 percent of its key processes under control one year before production.

The ability to establish statistical process control for the key manufacturing processes during product development is, to a large extent, a cumulative effect. It is dependent upon the knowledge gathered from the beginning of product

development (when the firm chooses appropriate technologies for the product), continues through critical design reviews (when product design is matured and drawings are "frozen"), and culminates when manufacturing personnel achieve consistent results from the processes.

Different Demands

In recent years, changes leading commercial firms made in their practices for developing and manufacturing a major product yielded the kinds of results DoD seeks. But these practices cannot be readily adopted in the current acquisition climate. The environment in which a DoD program is managed imposes different demands on its program managers than those found in the commercial sector. The way success and failure are defined for commercial and DoD programs differs considerably, which creates a different set of incentives and leads to different behaviors for managing the programs. Specific practices take root and are sustained because they work — they help a program succeed in its particular environment.

The success of a commercial program is determined by the amount of profit the firm makes on items sold to customers. The point of sale occurs after product development is complete; program success is determined in production when the customer buys the finished product. Failure is clearly defined as the customer walking away and buying a competitor's product. This reality, coupled with the pressure to shorten cycle times to meet market demands, makes production concerns a primary focus in the decision to begin product development and make technology trade-offs. It shapes an environment that encourages early identification of unknowns and judging risks accordingly. Not knowing something about a product is *not* okay — it gets a "red" in the parlance of DoD's red-yellow-green spotlight chart.

Strong incentives, both positive and negative, stress realistic estimates of cost, schedule, and performance. A low-balled or optimistic estimate could lower profit or cause the customer to walk away. In

other words, unrealistic estimates invite failure. As a Chrysler vehicle manager told us, an important aspect of the program manager's role is to say "no" to anything, such as incorporating immature technologies that may disrupt the product's cost, schedule, or performance targets. Moreover, a program manager has the responsibility to reject a technology or design feature that might otherwise improve vehicle performance if those who propose it cannot prove — with either facts and data from predecessor technology or actual prototypes — that the component can be produced within cost, quality, and quantity targets.

The definition of success is more complicated in DoD. The point of sale begins at the start of program development when competing demands encourage overpromising performance while underestimating cost and schedule. Success is measured throughout development as the customer (the Services and Congress) pays for the product on an installment basis. Production is generally so far off — perhaps 10 years or more — that it does not curb technology or design decisions that promise performance but carry high cost and schedule risks. By the time production does begin, the customer is deeply vested and unlikely to walk away. As a result, and in contrast to the commercial environment, success in weapon system programs is substantially ensured before end items are produced.

The pressures and incentives in the DoD environment explain why the behaviors — and practices — of program managers differ from those in commercial programs. Risks in the form of ambitious technology advancements and tight cost and schedule estimates are accepted in the DoD environment as necessary for a successful launch. Clearly, some of these risks derive from the increased capability desired by the user. However, the risks are also shaped by the competition for funding. Problems or indications that the estimates are decaying do not help sustain the program in subsequent years, and thus, their admission is implicitly discouraged. Although these practices can be devastating to a commercial program, they work in DoD

product developments because they can help a program survive.

To illustrate, the initial production readiness review held for the F-22 in 1995 reported no high risks — no “reds” — despite the fact that less than one-third of the engineering drawings were done at the time. In other words, not knowing was an acceptable risk. The next year, an independent team found the program to have significant manufacturing and producibility problems — and the costs have continued to escalate beyond estimates.

These pressures of the defense environment are not unknown.³ A 1994 Defense Systems Management College (DSMC) study noted that government program managers found their formal role of objective program management at odds with their informal role as program managers.⁴ The study, which relied on over 80 interviews with DoD and industry program managers, also stated that, “A feeling of responsibility for program advocacy appears to be the primary factor causing government managers to search aggressively and optimistically for good news relating to their programs, and to avoid bad news, even when it means discrediting conventional management tools that forecast significant deviations from plan.”

None of the foregoing should be interpreted as a criticism of DoD program managers’ abilities or intentions. We did not observe that commercial managers were somehow better or more ethical than their DoD counterparts. On the contrary, DoD managers see the acquisition of the weapons under their purview as aligned with national interests. They do what they believe is right, given the pressures they face. The difference is that the definition of program success determines what is right, and that definition differs in the two sectors.

Nor does the foregoing discussion deny that tangible differences can exist between the complexity of military and commercial products or that user needs can necessitate taking greater risks on some military developments.

The point is that attaining technical, design, and production knowledge is fundamental to commercial and DoD product developments, and best commercial practices in these areas can help DoD programs get better outcomes. Still, changes in the defense environment are essential to the successful adoption of

crease because of changing requirements over which they have no control. Thus, the challenge for DoD and congressional decision makers may not lie so much in the “how to” aspects of product development as in creating the incentives — the reasons why best practices will work for program managers. Therein lies the challenge decision makers must meet if they are to realize the goal of “better, faster, cheaper.”

For commercial practices to help weapon system programs, they must help a program succeed in the DoD environment.

Thus, the DoD environment must become conducive to such practices. We think at least two factors are critical to fostering such an environment.

Separate Development

First, program launch decisions must not hinge on the current practice of overpromising performance and underestimating resources to be successful. The pressure to amass broad support to launch a program creates pressure to embrace far more technology than

can reasonably be delivered on time. The primary way to relieve this pressure is by separating technology development from product development and redefining the point for launching programs as the point at which technology development ends and product development begins.

One could argue that this approach won’t work for weapon systems. That is, because DoD has to maintain the technological superiority of its weapons, the Department has to push technology faster and to take greater risks than the commercial sector. Clearly, DoD’s weapons have to continue their superiority — something they cannot give up in the effort to be faster and cheaper. The question is not whether technology should be pushed but how to make the push. This is where commercial experience is relevant. Leading commercial

Leading commercial firms achieved these goals [better, faster, cheaper] because they asked their PMs to do less to develop the product, not to develop technology and defend the program as well.

those practices. We now turn our attention to these changes.

Charting a Course for Better Outcomes

DoD’s guidance on how to prepare weapons for successful transition to production [some of it now 10 years old], already has much in common with best commercial practices. In recent years, DoD has embarked on several initiatives that draw lessons from commercial practices, such as cost as an independent variable and integrated product teams. However, changing the mechanics of a weapon’s development, without changing the environment that governs its incentives, may not produce desired results.

For example, program managers cannot be expected to meet program cost estimates if technology costs continually in-

firms keep their programs on track by making the technology push and taking risks before the program is launched — not within the bounds of a program whose purpose is to put end items in production.

Technology development's pace and resource requirements are hard to gauge; failures are expected in the discovery process. In a product development or a weapon system, on the other hand, success is expected. Concomitant with defining the program launch later in the acquisition cycle must be the willingness of decision makers in DoD and the Congress to support research and development efforts to advance technology outside of individual programs.

Confront Risks Early

Second, once a program is underway, program managers must be encouraged to identify unknowns as high risks so that they can be aggressively worked on earlier in development. In commercial programs, the threat of the customer walking away forces program managers to confront risks candidly and attack them early. Discipline is provided from within the programs. To help create a similar situation on weapon system pro-

grams, DoD must send the signals that create incentives for acquisition managers to identify unknowns and ameliorate their risks in early development. The more powerful vehicles for sending these signals may be decisions on individual programs, rather than broad policy announcements.

For example, incentives could take the form of a decision to fully fund one program's efforts to mitigate a high risk identified early or requiring another program in which risks are revealed late to absorb the associated financial consequences. The indicators we used in the three knowledge points are one way to identify such risks earlier. Congress will need to back these incentives with its actions.

Better Position to Succeed

The goals of better, faster, and cheaper, are admirable and desirable. Yet they will not succeed if they are mainly additive; that is, if weapon system program managers and program teams are simply asked to do more. Leading commercial firms achieved these goals because they asked their program managers to do less: to develop the product, not to develop technology and defend the program as well. The key to achieving similar goals

on weapon systems may well be fostering an environment within DoD that puts its program offices in a better position to succeed.

ENDNOTES

1. The Readiness and Management Support Subcommittee has taken responsibility for these issues in the current Congress.
2. *Best Practices: Successful Application to Weapon Acquisitions Requires Changes in DoD's Environment* (General Accounting Office/National Security and International Affairs Division [GAO/NSIAD]-98-56, Feb. 24, 1998) and *Best Practices: Better Management of Technology Development Can Improve Weapon System Outcomes* (GAO/NSIAD-99-162, July 30, 1999). To order copies, call (202) 512-6000, fax your request to (202) 512-6061, or download the reports from GAO's Web site at <http://www.gao.gov>.
3. We reported on DoD's acquisition culture in *Weapons Acquisition: A Rare Opportunity for Lasting Change* (GAO/NSIAD-93-15, December 1992).
4. *Critical Issues in the Defense Acquisition Culture* (Defense Systems Management College, December 1994).

Army Roadshow Dates

Army Acquisition Workforce 2000 Briefing Dates	Mobile Acquisition Career Management Office	Location
April 15	April 15-16	Atlanta, Ga.
April 28	April 28-29	Fort Monroe, Fort Lee, Fort Eustis, Va.
May 3	May 4-5	Fort Monmouth, N.J.
May 4	May 5-6	Picatinny, N.J.
May 19	May 19-20	Fort Bragg, N.C.
June 15	June 15-16	Warren, Mich.
July 12	July 12-13	Europe (Germany)
July 13	July 15-16	England
Aug. 10	Aug. 10-12	Natick, Mass.
Aug. 23	Aug. 24-25	Huntsville, Ala.
Sept. 14	Sept. 15-17	Edgewood/Aberdeen Proving Ground, Md.
Nov. 4	Nov. 4	Yuma, Ariz.
Nov. 16	Nov. 16-17	White Sands Missile Range, N.M.
Nov. 18	Nov. 18	Fort Huachuca, Ariz.
Dec. 20 (tentative)	Dec. 20	Rock Island, Ill.

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(202) 456-1111



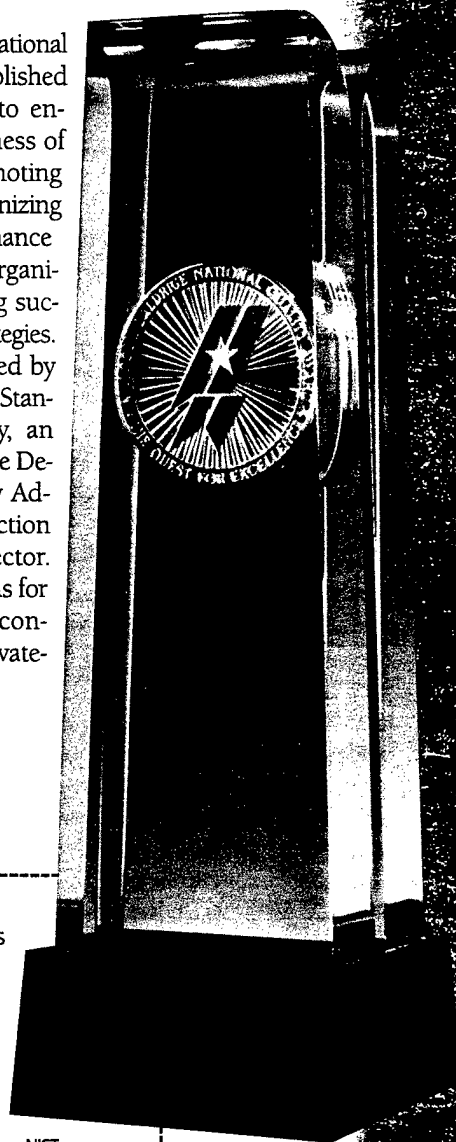
President Clinton Announces 1999 Baldrige Award Winners

The President today announced the 1999 winners of the Malcolm Baldrige National Quality Award. Four organizations — STMicroelectronics, Inc., Region Americas (Carrollton, Texas, Manufacturing); BI (Minneapolis, Minn., Service); The Ritz-Carlton Hotel Company, L.L.C. (Atlanta, Ga., Service); and Sunny Fresh Foods (Monticello, Minn., Small Business/Manufacturing) — are being honored for their achievements in performance excellence.

"The Malcolm Baldrige National Quality Award plays a major role in revitalizing our Nation's economy, competitiveness, and quality of life. Through their tireless quest for excellence, the 1999 Baldrige Award recipients are models for any organization that wants to improve performance and competitiveness," the president said.

"Although no Baldrige Award recipients were named in the new education and health care categories, I am delighted that our Nation's schools and health care organizations are now full partners in the Baldrige National Quality Program. I am proud of the 25 education and health care organizations that participated in this first year's process, and I have no doubt that in the years to come this program will play a key role in revitalizing our education and health care systems," said the president.

The Malcolm Baldrige National Quality Award was established by Congress in 1987 to enhance the competitiveness of U.S. businesses by promoting quality awareness, recognizing the quality and performance achievements of U.S. organizations, and publicizing successful performance strategies. The program is managed by the National Institute of Standards and Technology, an agency of the Commerce Department's Technology Administration, in conjunction with the private sector. Screening of applications for the Baldrige Award is conducted by a mostly private-sector board of experts.



THE MALCOLM BALDRIGE
NATIONAL QUALITY AWARD IS
THE HIGHEST HONOR
BESTOWED TO INDUSTRY IN
RECOGNITION OF QUALITY
AND WORLD-CLASS BUSI-
NESS PERFORMANCE.

Photo by Steuben, provided courtesy NIST

Acquisition Community Gathers at DSMC for Ninth PEO/SYSCOM Commanders' Conference

"Going Commercial — Building On Our Achievements"

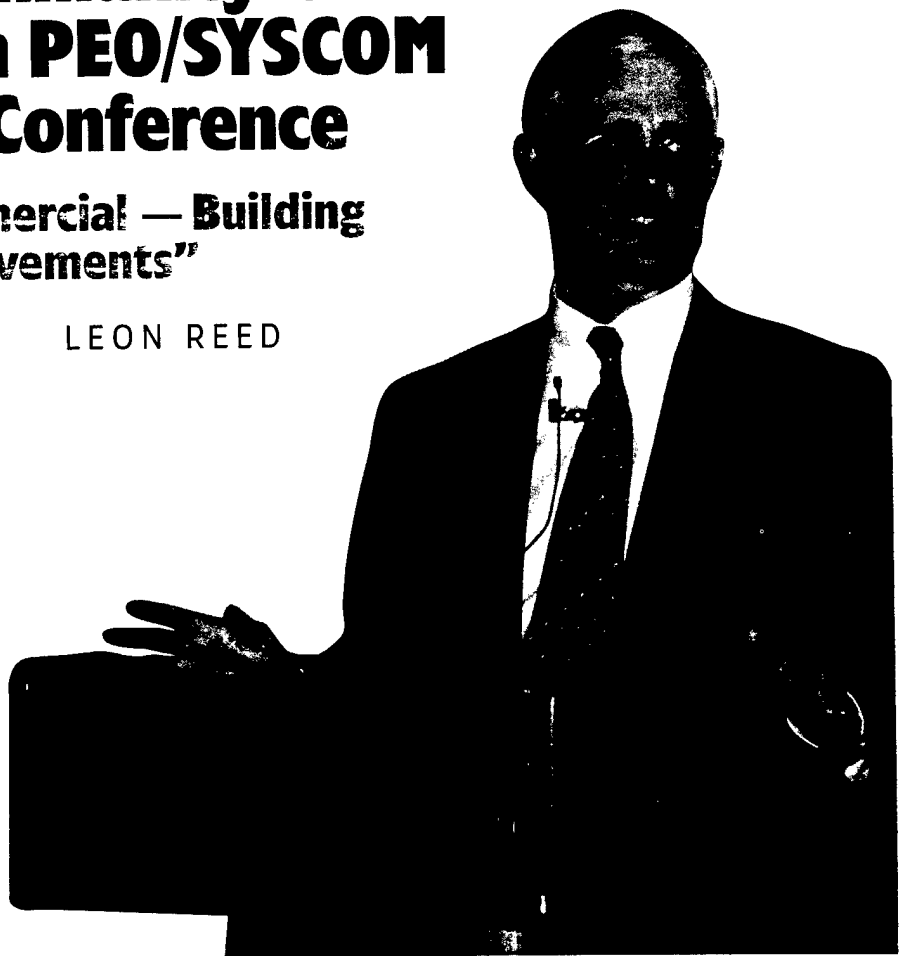
LEON REED

The Program Executive Officer/Systems Command (PEO/SYSCOM) Commanders' Conference is one of the longest running forums to review progress in achieving DoD's acquisition reform objectives. Nearly 500 representatives of the DoD acquisition community and defense industry came to DSMC Oct. 19-20 to exchange success stories and lessons learned at the ninth conference in this continuing series. Building on the results of the spring PEO/SYSCOM Commanders' Workshop, the fall conference focused on "Going Commercial — Building on Our Achievements."

Keynote Address

DSMC's new commandant, Air Force Brig. Gen. Frank J. Anderson Jr., welcomed the attendees to DSMC, stressing that it is "critical that we do better at implementing commercial initiatives." As is the custom at these high-level but informal sessions, Dr. Jacques S. Gansler, Under Secretary of Defense (Acquisition, Technology, and Logistics), served as the conference keynote speaker. Congratulating the audience on the real accomplishments achieved to date, he challenged them to continue this progress.

Gansler noted that dramatic changes are required in the way DoD and industry operate because of rapid changes in technology and the threat environment. He noted new and changing sources of instability in the world, including nuclear detonations by India and Pakistan, at-



"We need to change the way we buy and field new systems. We need to follow a spiral requirements process, where we put things in the field and then improve them. In addition, unless we get ways to dramatically reduce the costs of these systems, we won't be able to afford them."

—Dr. Jacques S. Gansler
Under Secretary of Defense
(Acquisition, Technology and Logistics)

Reed is a member of the research staff, Institute for Defense Analyses, Alexandria, Va.

tacks on U.S. embassies, increased threats from cyber-war and chemical-biological capabilities, and recent instability and conflict in Kosovo. As a result, he stated that, "Threats I would have talked about two years ago as potential threats for the 21st century now are here." This has changed the way DoD must approach many problems. "We're truly seeing a change in our military requirements, tactics, strategy, doctrine, and requirements for coalition warfare, all happening at the same time as you in industry are seeing a globalization of industry and a consolidation of industry taking place."

Gansler also pointed out that the advanced technologies that we require for military performance increasingly are available to potential adversaries, quickly and at relatively low cost, either in commercial or international arms markets. "When you see our systems going through a 12- to 15-year development

cycle, and an 18-month life cycle for information technology, something doesn't add up," said Gansler. "We need to change the way we buy and field new systems. We need to follow a spiral requirements process, where we put things in the field and then improve them. In addition, unless we get ways to dramatically reduce the costs of these systems, we won't be able to afford them."

Gansler noted that he has continued to pursue the same four top priorities during his entire tenure in office.

Give Warfighters the Right Equipment

First, DoD "must equip 21st century warfighters with the right equipment." This requires implementing the Revolution in Military Affairs with a major emphasis on low-cost, all-weather, precision capabilities; counters to asymmetric threats (cyber warfare, low-tech weapons of mass destruction); and in-

teroperability with our allies. Recent experience suggests that U.S. military units will continue to be called on to participate in multinational forces, and interoperability will continue to grow in importance.

Generate Resources to Pay for New Forces

Second, DoD must generate the resources to pay for new forces through the Revolution in Business Affairs. DoD must change the way it does business, including more reliance on competitive sourcing, privatization of housing, as well as "full implementation of the acquisition reforms we've begun and expanded over the past few years." Gansler called for DoD to apply "nontraditional approaches" such as much more use of commercial equipment, integrated digital environment, and further civil-military integration to take advantage of commercial practices such as lean manufacturing.



FROM LEFT: STAN SOLOWAY, DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION REFORM); R. NOEL LONGUEMARE, CONSULTANT; DAVID OLIVER, PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION, TECHNOLOGY AND LOGISTICS); AND AIR FORCE BRIG. GEN. FRANK J. ANDERSON JR., DSMC COMMANDANT.

NINTH PEO/SYSCOM COI

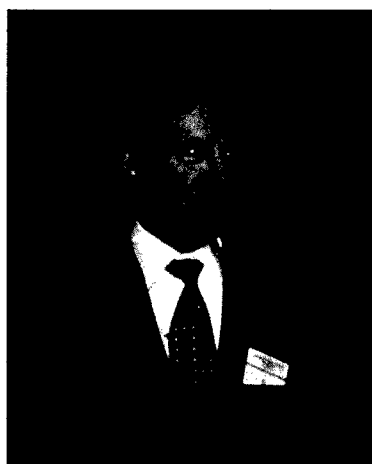


SHOWING THEIR TEAMWORK — MEMBERS OF THE "TRACK 1 PBA: POINT/COUNTERPOINT" PANEL. FROM LEFT: HERM REININGA, VICE PRESIDENT FOR OPERATIONS, ROCKWELL COLLINS; LARRY UHLFELDER, ASSISTANT DIRECTOR, POLICY & PLANS, DEFENSE CONTRACT AUDIT AGENCY; MEREDITH MURPHY, DIRECTOR OF BUSINESS AFFAIRS AND ACQUISITION POLICY, THE BOEING COMPANY; WILLIAM STUSSIE, DEPUTY ASSISTANT SECRETARY OF THE NAVY (AIR PROGRAMS); AND RICHARD SYLVESTER, ASSISTANT DEPUTY UNDER SECRETARY OF DEFENSE (SYSTEMS ACQUISITION).

► DR. DANIEL GOLDIN, ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, ASSESSED CONTRACTING ISSUES IN NASA AND THROUGHOUT THE FEDERAL GOVERNMENT AT THE DAY 2 LUNCHEON.



FROM LEFT: LOUIS KRATZ, DIRECTOR, LOGISTICS SYSTEMS REENGINEERING, DUSD(L); BLAISE DURANTE, DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE FOR MANAGEMENT POLICY AND PROGRAM INTEGRATION; AND EILEEN ROBERSON, NAVY ACQUISITION REFORM EXECUTIVE.



▲ DR. VITALIJ GARBER, THE NEWLY APPOINTED DIRECTOR OF INTEROPERABILITY, SERVED AS MODERATOR FOR THE INTEROPERABILITY PANEL.



▲ NAVY REAR ADM. MARTIN MAYER, DIRECTOR FOR STRATEGY, REQUIREMENTS AND INTEGRATION, JOINT FORCES COMMAND.



▲ PANEL ON "GOING COMMERCIAL ON THE BATTLEFIELD — IMPLICATIONS ON THEATER OPERATIONS." FROM LEFT: KATHRYN SZYMANSKI, CHIEF COUNSEL, U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND; AIR FORCE MAJ. GEN. GEOFFREY LAMBERT, DIRECTOR OF THE CENTER FOR OPERATIONS, PLANS AND POLICY, SPECIAL OPERATIONS COMMAND; RETIRED NAVY VICE ADM. WILLIAM HANCOCK, FORMER DEPUTY CNO FOR LOGISTICS, CURRENTLY WITH TECHNOLOGY STRATEGIES & ALLIANCES; LEE FRAME, DEPUTY DIRECTOR, OPERATIONAL TEST AND EVALUATION (CONVENTIONAL SYSTEMS); RETIRED ARMY MAJ. GEN. CHARLES FIALA, VICE PRESIDENT AND CHIEF OPERATING OFFICER, BROWN AND ROOT SERVICES; THOMAS EDWARDS, DEPUTY TO THE COMMANDER, U.S. ARMY COMBINED ARMS SUPPORT COMMAND; AIR FORCE COL. JOHN BELCHER, CHIEF CONTRACTING DIVISION, U.S. AIR FORCE AIR COMBAT COMMAND; AND DAVID OLIVER, PRINCIPAL DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION, TECHNOLOGY AND LOGISTICS), WHO SERVED AS PANEL MODERATOR.

► PERSPECTIVES ON "WHAT'S WORKING," "WHAT'S NOT WORKING," AND "HOW TO PICK UP THE PACE." SEATED FROM LEFT: NAVY VICE ADM. PETE NANOS, COMMANDER, NAVAL SEA SYSTEMS; ARMY MAJ. GEN. JOHN MICHITSCH, PEO, GROUND COMBAT AND SUPPORT SYSTEMS; LOUIS KRATZ, DIRECTOR, LOGISTICS SYSTEMS REENGINEERING, DUSD (L); AND STAN SOLOWAY, DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION REFORM). STANDING FROM LEFT: JOHN ROTH, DEPUTY DIRECTOR FOR INVESTMENT, OSD COMPTROLLER; PETE DeMAYO, VICE PRESIDENT FOR CONTRACT POLICY, LOCKHEED MARTIN INC.; AND NAVY CAPT. PAUL SULLIVAN, PROGRAM MANAGER, VIRGINIA CLASS SUBMARINE PROGRAM OFFICE.

MANDERS' CONFERENCE

LAWRENCE DELANEY, ASSISTANT SECRETARY OF THE AIR FORCE (ACQUISITION).

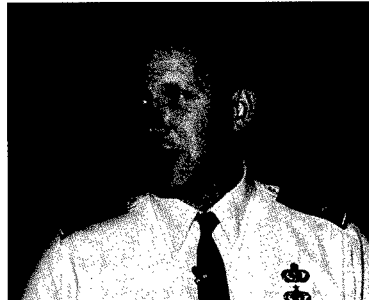
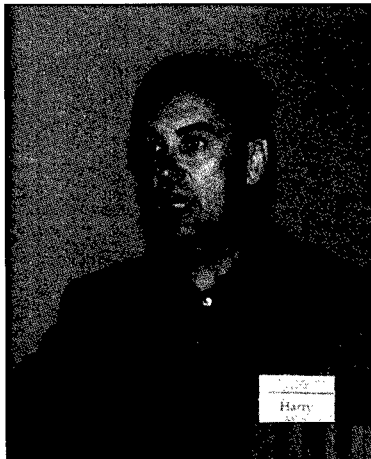


FROM LEFT: DELANEY, WILLIAM SCHAEFER, DEPUTY ASSISTANT SECRETARY OF THE NAVY (PLANNING, PROGRAMMING, AND RESOURCES); AND PAUL HOEPER, ASSISTANT SECRETARY OF THE ARMY (ACQUISITION, LOGISTICS & TECHNOLOGY).

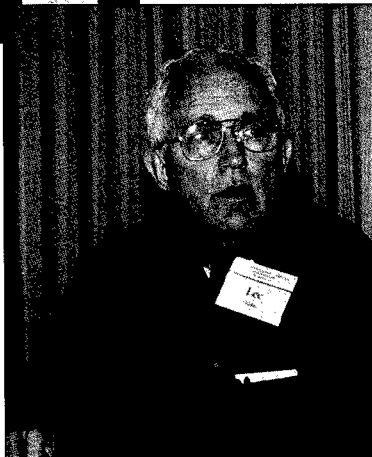


►"THE ROAD AHEAD — ACCELERATING THE TRANSFORMATION OF DoD ACQUISITION AND LOGISTICS PROCESSES AND PRACTICES." PANEL MEMBERS SYLVESTER AND WILLIAM MOUNTS, DIRECTOR OF INTERNATIONAL AND COMMERCIAL SYSTEMS ACQUISITION.

◀HARRY SCHULTE, ACQUISITION EXECUTIVE FOR SPECIAL OPERATIONS COMMAND (USSOCOM) DISCUSSED "LOGISTICS INITIATIVES FOR SPECIAL OPERATIONS COMMAND."



▲ IN HIS PRESENTATION DURING TRACK 2, "GOING COMMERCIAL IN DLA," AIR FORCE COL. WALTER KOZAK, EXECUTIVE DIRECTOR, PROCUREMENT, DEFENSE LOGISTICS AGENCY (DLA) DESCRIBED CHANGES DLA HAS MADE IN ITS CULTURE AND OPERATIONS TO BECOME MORE RESPONSIVE AND CUSTOMER-FOCUSED.



◀LEE FRAME, DIRECTOR, OPERATIONAL TEST & EVALUATION.



DR. CAROLE SLEDGE (LEFT) OF THE SOFTWARE ENGINEERING INSTITUTE OUTSIDE THE SEI EXHIBIT.



Logistics System Modernization

Logistics system modernization was the third priority noted by Gansler. "The primary objective of logistics system modernization is to enhance our responsiveness and dependability for the warfighter. Simultaneously, we will save money as well, though that is not the main reason why we're making these changes."

Accelerate Transformation of Defense Industrial Base

Finally, DoD must continue and accelerate the transformation of the defense industrial base by taking greater advantage of world-class commercial suppliers, adopting commercial practices, and pursuing globalization. He asserted that the emerging trend toward increased use of trans-Atlantic partnerships is one way for industry to pursue interoperability.

Gansler discussed a few recent policy initiatives and organizational changes brought about by the new Defense Authorization Act. The first of these was a significant upgrade in the organizational prominence of logistics. One change, which he characterized as "not important since I already acted that way," was to include "logistics" in the name of his organization, which is now "Acquisition, Technology and Logistics." The FY2000 Authorization Act also elevated the director of logistics to a position requiring Senate confirmation.

Another organizational initiative was the creation of an Office of Interoperability to work with the Joint Staff and the acquisition community to focus on this critical issue. Earlier this year, he co-signed a memorandum requiring future development programs to address both cost and interoperability as Key Performance Parameters.

In closing, Gansler noted that most people seem to be in general agreement that changes are needed in the way we design, buy, and support our forces. What is missing, he said, is a sense of urgency about making these changes. He asked the support of all the conference attendees in helping build a renewed sense of urgency about these reforms.

Follow-up Actions From the Last Conference/Workshop

With any ongoing conference series, inevitably some attendees sooner or later will ask: "What are the follow-up actions from what we discussed here?" One new feature of this conference was a presentation by Stan Soloway, Deputy Under Secretary of Defense (Acquisition Reform), which summarized "Activities Since the Last Conference." To follow up on issues raised at the fall 1998 Eighth PEO/SYSCOM Commanders' Conference and spring 1999 PEO/SYSCOM Commanders' Workshop, Soloway discussed actions that have been taken in the areas of requirements, civil-military integration, Price Based Acquisition (PBA), and reduction of total ownership costs.

Major progress has been made in the requirements area through the Section 912c study process. Chairman, Joint Chiefs of Staff Instruction (CJCSI) 3170.01 has already been changed, and the Office of the Secretary of Defense (OSD) has begun to revise the 5000-series of acquisition policy instructions to focus on evolutionary acquisition, spiral development, and interoperability.

In the area of civil-military integration, Soloway described several legislative initiatives that help lower the barriers to integration of commercial and military sources, including improvements in cost accounting standards and handling technical data. He also stated that DoD has initiated a major review of Military Specifications and Standards reform. A multidisciplinary industry-government working group has been established to examine how standardization can help support DoD initiatives to reform the logistics system and reduce total ownership costs.

Soloway stated that "We continue to believe Price Based Acquisition offers some tremendous opportunities." Work continues on a PBA policy document, with the current effort focusing on incorporating more than 500 comments received on a previous draft.

"Service activities under the Reducing Total Ownership Costs (R-TOC) initia-

tive are moving forward, with initial R-TOC plans due from the 30 pilot programs by the end of October." Soloway noted that these plans involve "a tremendous amount of work," including identification of total ownership cost reduction opportunities, barriers to accomplishing these actions, and support needed from the Services or OSD. Soloway took particular note of the Cost Reduction and Effectiveness Improvement Council (CREIC), an organization established by the Navy to identify significant opportunities for ownership cost savings and to provide funding for these opportunities.

Soloway emphasized his office's effort to use feedback from the acquisition community, as in its incorporation of 500 comments on drafts for PBA policies and procedures. He also described the new Change Management Center, which his office established after the conclusion of the 912c study on changing to a commercial environment. The Change Management Center incorporates commercial best practices and provides assistance to programs and other field organizations that are undergoing rapid change.

Interoperability Panel

Dr. Vitalij Garber, newly appointed Director of Interoperability, chaired a panel presentation on interoperability. He discussed the importance of interoperability and outlined plans to develop an overarching strategy and architectures for interoperability. Increasingly, interoperability has grown from an inter-Service to a multinational issue. U.S. forces more often are participating in multinational forces, which has made interoperability requirements more complex and more urgent.

Other participants included Navy Rear Adm. Martin Mayer, Director for Strategy, Requirements, and Forces, Joint Forces Command; and Navy Rear Adm. Robert Nutwell, Deputy Assistant Secretary of Defense for Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance (C3ISR) and Space Systems. Mayer described several recent examples of the potential con-

sequences of not having interoperability, including prominent communications problems in the invasion of Grenada, the Persian Gulf conflict, and recent actions in the Balkans. Nutwell noted that interoperability increasingly is a C3I issue. He described the 1999 Chief Information Officer (CIO) legislation, which is intended to ensure C3I interoperability.

The Road Ahead

The final two presentations of the Day 1 morning session, presented by Richard Sylvester, Assistant Deputy Under Secretary of Defense (Systems Acquisition) and William Mounts, Director of International and Commercial Systems Acquisition, focused on the theme, "The Road Ahead: Accelerating the Transformation of DoD Acquisition and Logistics Processes and Practices." Describing actions that are underway to maintain and accelerate the pace of change in acquisition and support processes, they noted that many of the necessary policy and legislative actions have now been taken, and it is particularly important to emphasize two important areas:

- Development and application of metrics to quantify the rate of progress.
- Steps to promote the cultural change necessary to support changes in acquisition and support processes.

In conducting the 912c study on changing to a commercial environment, various organizational change experts told OSD that organizations often find their current workforce and culture to be among the biggest obstacles to significant change. To help acquisition programs and organizations cope with rapid organizational change, OSD has developed a Change Management Center.

Luncheon Speaker

David Oliver, Principal Deputy Under Secretary of Defense (Acquisition, Technology, and Logistics) challenged the conference attendees to propose bold solutions to acquisition and life cycle issues. He stated that the capability of future defense forces would depend heavily on the actions taken in the next few

years to reduce total ownership costs and improve force effectiveness. Because of decisions and investments made years ago, Oliver asserted, "We couldn't help but succeed." But, he stated, the effectiveness of U.S. forces in the future will be heavily dependent on actions we take now to improve affordability and effectiveness.

Oliver also noted that OSD has limited authority and resources to pursue new initiatives, but that one proper role for OSD is to provide assistance in political and budgetary issues that are broader than a single Service can handle. He discussed several recent examples where OSD worked closely with the Services and helped overcome political or institutional barriers.

Afternoon Session — Breakout Groups

The afternoon session consisted of three separate tracks, which were held at dispersed sites on the DSMC campus.

Track 1

The first track was chaired by Richard Sylvester, Assistant Deputy Under Secretary of Defense (Systems Acquisition). A lead-off panel of industry and government presenters, reflecting a mix of specialties and backgrounds, discussed PBA.

- Meredith Murphy, Director of Business Affairs and Acquisition Policy, The Boeing Company
- Herm Reininga, Vice President for Operations, Rockwell Collins
- William Stussie, Deputy Assistant Secretary of the Navy (Air Programs)
- Larry Uhlfelder, Assistant Director, Plans and Policy, Defense Contract Audit Agency.

Participants agreed that not every program is a suitable candidate for PBA. A general sentiment was that the dividing line between suitability and unsuitability should be drawn on the basis of technical risk. At the leading edge of technology — such as the F-22 aircraft — letting industry assume all of the risk seemed unrealistic and not workable. On the other hand, clear candidates for

PBA can be found at the low-risk part of the spectrum — chocolate chip cookies, as an example.

However, most government purchases do not fall at the extremes. There is a large gray area. Examples in this gray area might be commercially available parts that need to be repackaged for military purposes. The risk is greater than just supplying an off-the-shelf product, but industry felt that they could assume this risk if it was balanced by the potential rewards.

Gia Harrigan and Beth Miller, Naval Undersea Warfare Center (NUWC), presented "Empowering the Workforce with Balanced Scorecards." They described a strategic planning process at NUWC, which was instituted as a result of a reorganization of the command. The original command underwent changes involving a relocation and, perhaps more important, a transition to a customer-funded operation. NUWC's managers used the Balanced Scorecard methodology successfully to involve employees in the management of organizational changes.

Dr. Joseph Ferrara, Deputy Director for Acquisition Systems Management, concluded Track 1 with a description of the process currently underway to change the DoD 5000 document. He reported on the cautious procedures that are in place to ensure that proposed changes to the document are fully reviewed.

Track 2

Track 2 was chaired by Skip Hawthorne, Office of the Deputy Under Secretary of Defense (Acquisition Reform). Dr. Carole Sledge of the Software Engineering Institute addressed "COTS Based Systems — Keys to Success." Sledge's presentation focused on how to incorporate COTS-based systems (CBS) into existing organizations. Especially important to understand, she stated, is the difference between COTS and other types of systems. COTS products are:

- Sold, leased, or licensed to the public.
- Offered by a vendor trying to make a profit by selling a COTS product.

- Supported and evolved by the vendor, who also retains intellectual property rights.
- Available in multiple identical copies.
- Used without modification of the internals.

Sledge identified key pitfalls in implementation of COTS, including the adopting organization's failure to recognize the need to adapt existing systems and processes to the new CBS (rather than vice versa). The advantages of COTS-based systems can be negated if the adopting organization fails to recognize changes required in its existing processes or insists on customizing the "COTS" packages.

The major part of her presentation focused on what she described as the keys to successful COTS implementation:

MAKE COTS-BASED SYSTEM TRADE-OFFS

- Reconcile products and users' operations.
- Leverage the marketplace.
- Engineer an evolvable architecture.
- Make trade-offs simultaneously.
- Avoid COTS modifications.

THINK MORE LIKE A BUSINESS

- Live by the business case.
- Negotiate licenses and supplier relationships.
- Realign budgets for market realities.

ESTABLISH EVOLUTION AS A WAY OF LIFE

- Evolve COTS-based systems continuously.
- Take the long view on systems acquisition.

CHANGE THE CULTURE

Change how you think about your business, how you execute your business, how the organization is structured and operates, and how your reward structure operates.

In closing, Sledge pointed out that establishing a COTS infrastructure and planning the transition to COTS-based systems are both vital to the success of a COTS strategy. Any organization plan-

ning to implement COTS must assess organizational readiness, perform pilots, plan necessary organizational changes, and train people in the new systems and organizational changes required. The necessary infrastructure includes establishing necessary market research and technology watch capabilities, establishing facilities and staff for CBS, and providing examples and guidelines for implementation.

Also speaking during Track 2 were John Gehrig, Deputy Director for Resources and Ranges (Operational Test and Evaluation) and Air Force Col. Walter Kozak, Executive Director, Procurement, Defense Logistics Agency (DLA). Gehrig described recent changes in the test and evaluation (T&E) process, including the merger of development test and evaluation (DT&E) and operational test and evaluation (OT&E). He described the OSD Corporate Strategy for T&E Resources, which includes a goal to develop strategic partnerships with the Program Executive Officers (PEO) to reduce T&E expenditures and provide opportunities for joint ventures. He argued that win-win solutions, allowing T&E and acquisition communities to work together effectively and conserve resources, are necessary. Resource cutbacks have hit the test community very hard in recent years, forcing significant cutbacks in personnel and deferral of initiatives to modernize test facilities. However, funding should increase modestly in coming years, which will allow the T&E community to make some long-needed investments.

"We're trying to get away from a traffic cop mentality and work in partnership with the PEOs," said Gehrig. Identifying ways to economize on test resources and share test technologies and resources is an important part of this partnership.

Kozak's presentation, "Going Commercial in DLA," described changes DLA has made in its culture and operations to become more responsive and customer-focused. Kozak noted that DLA is now six to seven years into a fundamental change process. This change process has resulted in DLA shedding a great number

of functions and concentrating on what it does best. "DLA is trying to be not only a more important player, but also a better partner," said Kozak.

Kozak described "DLA 21," DLA's strategic plan, which emphasizes commercial practices. The strategic plan calls for DLA to be "smaller, more agile, and more relevant." The number of positions at DLA has been reduced by one-third (to 42,000) from its 1992 peak of 65,000; another 10,000 positions will be eliminated by 2005.

DLA has placed a major emphasis on benchmarking best practices (both government and industry) in developing its organizational transformation plan. Besides modernizing its business systems, DLA has also instituted a number of strategic sourcing activities, including prime vendor/virtual prime vendor (PV/VPV) and direct vendor delivery. Further, DLA has also made a priority of organizational redesign and workforce development.

Important changes in DLA's operations include the location where services are provided and a new weapon system focus. Six years ago DLA was predominantly a CONUS-based activity; DLA now has developed contingency support teams, which are part of the first group to arrive in any new deployment around the world. DLA has also realigned the way it manages more than four million items by establishing a weapon system focus. Each system supported by DLA now has a single point of contact, even if the parts supporting that system are the responsibility of several different supply centers and contracts. In summarizing DLA's activities to become more customer-focused and efficient through strategic supplier alliances, PV/VPV arrangements, and long-term contracts, Kozak asserted that "DLA is in a unique position to build a DoD supply chain, tailored to program needs."

Track 3

The session was chaired by Dr. Spiros Pallas, Principal Deputy to the Director, Strategic and Tactical Systems, Office of the Under Secretary of Defense (Acqui-

sition, Technology, and Logistics). A lead-off panel of presenters from the Army, Navy, and Air Force Acquisition leadership discussed the status of the R-TOC program in their respective Services. Presenters were:

- Keith Charles, Deputy Assistant Secretary of the Army for Plans, Programs and Policy
- Eileen Roberson, Navy Acquisition Reform Executive
- Blaise Durante, Deputy Assistant Secretary of the Air Force for Management Policy and Program Integration.

Charles announced that the Assistant Secretary of the Army for Research, Development and Acquisition (ASA[RDA]) has been reorganized as the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA[ALT]) in recognition of the importance of logistics. A significant point in encouraging Operations and Maintenance (O&M) savings is an agreement that has been reached for ASA(ALT) to share O&M savings with O&M managers. This provides increased incentive for ASA(ALT) personnel to create O&M savings. He also pointed out that it is proper to spend O&M funds to increase reliability of spare parts, but not to enhance performance. (Research and development funding should be used for that purpose.) He said that seven or eight years ago the Army stopped the very tedious practice of asking soldiers to record all actions relating to vehicles and aircraft in an equipment logbook. This action, however popular with soldiers, has resulted in a loss of information on equipment usage and maintenance history. The Army is now embarked on a program to bring all of the CH-47 maintenance data up-to-date. He said this was possible in part due to the relatively small size of the CH-47 fleet.

Roberson reported on the Enterprise Resource Planning (ERP) and Earned Value Management (EVM) programs. The F-14 program is the "poster child" of the latter. She reported that the Navy has embarked on a five-year improvement program for Visibility and Management of Operation and Support Cost

(VAMOSOC) improvement. (VAMOSOC is the DoD-wide program to capture the Operating and Support [O&S] costs of major systems.) She noted that the data are on the World Wide Web for military and contractor use.

Durante reported on the Air Force's World Wide Web data system, AFTOC (Air Force Total Ownership Cost), and an R-TOC page, also on the World Wide Web. The latter has information on each Air Force pilot program. He also discussed the Air Force Corporate Structure (AFCS) and some of its processes. He described how issues and decisions flow upward from the panel level, chaired at the one-star or colonel-level, to the Air Force Group at the two-star level, the Air Force Board at the three-star level, and the Air Force Council at the four-star level.

Industry Perspective — DoD R-TOC Through Sustainment Best Practices

Just as industry has become a more visible participant in the PEO/SYSCOM Commanders' Workshops and Conferences, so too is industry participation vital to the success of DoD's R-TOC initiative.

- Bob Dickie, Parker Aerospace
- R. Noel Longuemare, Consultant
- Eddie McClendon, Raytheon-Tucson
- Mariann Pietras, Consultant.

McClendon opened the panel with a summary report stating that DoD still has too many unresolved impediments to allow for smart business decisions. Industry would like to help, but to date has not been allowed the flexibility to bring real R-TOC solutions to the table. Issues confronting joint industry-DoD partnerships include building trust between private and public partners, creating proper incentives, and correlating different Service policies. On partnering with competition, he said the idea was to "pick a good horse, and then ride him." The panel then opened the discussion for questions.

Guidelines for Pilot Programs

Army Col. James Stevens, Deputy Director Army Total Ownership Cost Re-

duction Office spoke about how Army pilot programs are critical to the logistics transformation needed to achieve Joint Vision 2010. The strategies, implementation elements, and outcome objectives that are fundamental to increased program manager oversight of system support coincide with the logistics transformation objectives of operational agility, improved customer service, and integrated logistics chains. The Army pilots are intended to accelerate the adoption of best practices — commercial and government — to transform weapon system support processes to meet the warfighters' urgent operational needs. Army pilot programs are the primary test beds for implementing product support reengineering initiatives envisioned for the Department's logistics transformation.

Stevens also discussed a set of proposed "Rules and Rights" for pilot programs. These are:

- A finite test period. (The pilot program places an additional burden on program managers and their staffs and should not be for an indefinite length of time.)
- Reporting requirements with Milestone Reviews.
- Baseline validation tracking systems.
- Required waivers.
- Funding stability.
- No wholesale changes should be made until they are proven.

Navy's Cost Reduction and Effectiveness Improvement Council (CREIC)

Navy Capt. Carl Froehlich, Office of Naval Resources, Warfare Requirements and Assessments concluded Track 3 discussions with a description of the process that is currently underway within the Navy to provide corporate visibility to R-TOC (and related) investment initiatives through the CREIC. The CREIC addresses current business practices that provide few incentives for risk-taking, no incentive to invest in an initiative if savings fall to another organization, and results in suboptimized/fragmented investment decisions. The CREIC process provides an annual

review to assess and prioritize potential investments that yield a high return on investment, reduce workload, enhance quality of life, and improve readiness. It creates positive incentives for participation by protecting unrealized savings and encouraging gain sharing between resource sponsors, program offices, and the fleet.

Day 1 Evening Session

Jeffrey Bialos, Deputy Under Secretary of Defense (Industrial Affairs) gave a short presentation on the reorganization of the Industrial Affairs office and its new emphasis on analyzing the potential impacts on DoD of industry restructuring, globalization, and other ongoing industrial trends. He described how these industrial developments can affect systems acquisition and urged program managers to consider industrial capability issues when they are making acquisition decisions.

The evening session was a high point of the conference and provided a lively discussion of the pros and cons for having contractor personnel on the battlefield to support products and the warfighter. David Oliver, Principal Deputy Under Secretary of Defense (Acquisition, Technology, and Logistics), served as moderator, and opened the panel by directing questions to specific panel members. Examples of contractor support during Desert Storm and in Kosovo were discussed, along with the problem and value of such support. Other participants included:

- Air Force Col. John Belcher, Chief Contracting Division, U.S. Air Force Air Combat Command
- Thomas Edwards, Deputy to the Commander, U.S. Army Combined Arms Support Command
- Retired Army Maj. Gen. Charles Fiala, Vice President and Chief Executive Officer, Brown and Root Services
- Lee Frame, Deputy Director, Operational Test and Evaluation, Conventional Systems
- Retired Navy Vice Adm. William Hancock
- Army Maj. Gen. Geoffrey Lambert, Director of the Center for Operations,

Plans and Policy, Special Operations Command

- Kathryn Szymanski, Chief Counsel, U.S. Army Communications-Electronics Command.

Day 2 — Special Operations Command

Harry Schulte, Acquisition Executive for Special Operations Command (USSO-COM) opened the second day's activities with a talk on "Logistics Initiatives for Special Operations Command." Special Operations Forces (SOF) logistics are based on three key components:

- The SOF Support Activity (SOFSA)
- SOF Sustainment, Asset Visibility and Information Exchange (SSAVIE)
- The Storefront.

SOFSA is a government-owned and contractor-operated logistics support facility that provides services to joint SOF units. Composed of Joint Operational Stocks (JOS) and Depot Agile Repair Teams (DART), JOS are centrally managed, stored, and maintained stockpiles of equipment available for loan to SOF units. DARTs provide depot-level work at several locations. Down time, on-site time, and costs are lowered significantly using DARTs. SSAVIE is an integrated, Web-based logistics system providing centralized asset and materiel management, while the Storefront provides customers a focused entry point into the whole system. Besides more responsive service, SOF is also beginning to address cost-reduction opportunities as well.

Panel on What's Working And What's Not Working

Deputy Under Secretary of Defense (Acquisition Reform), Stan Soloway chaired a panel entitled, "Perspectives on 'What's Working,' 'What's Not Working,' and 'How to Pick up the Pace.'" This was a unique panel where industry and Service representatives from various levels in the acquisition, logistics, and financial communities provided their views on strengths and weaknesses in DoD's current acquisition and logistics reform initiatives. Members of the panel included:

- Program managers' perspective — Navy Capt. Paul Sullivan, Program Manager, Virginia Class Submarine Program Office
- PEOs' perspective — Army Maj. Gen. John Michitsch, PEO Ground Combat and Support Systems
- Systems commanders' perspective — Navy Vice Adm. "Pete" Nanos, Commander Naval Sea Systems Command
- Logistics perspective — Louis Kratz, Director Logistics Systems Re-engineering, OSD Acquisition, Technology, and Logistics
- Industry perspective — Pete DeMayo, Vice President for Contract Policy, Lockheed Martin
- Comptrollers' perspective — John Roth, Deputy Director for Investment, OSD Comptroller.

While each speaker highlighted some difficulties with the speed and pace of commercialization, all agreed that commercial practices would ultimately benefit the acquisition community. Areas that were considered to be working included IPTs (though there was some sentiment that some IPTs may continue to function after they have outlived their usefulness); acquisition reform initiatives (including specifications reform and the single process initiative); electronic commerce; innovative contracts, including the use of Other Transaction Authority; and improved logistics initiatives such as direct vendor delivery. Areas identified by one or more speakers as needing further work included: incentives; the budget process; and modeling and simulation to replace testing. Several speakers noted the potential to reduce support costs through expanded contractor logistics support, but also observed that such initiatives are often subject to opposition from Capitol Hill.

Small Business Utilization

Robert Neal, Director, Office of Small and Disadvantaged Business Utilization, spoke on the contributions his organization can make to acquisition reform. "We're not a traffic cop," he said. "We're part of the acquisition team, and we're here to help you identify quality subcontractors who can help you accomplish your mission." He noted that it is

important for programs and prime contractors to provide increased opportunities for small business not only because it is a congressional requirement, but also because small businesses can provide an efficient and innovative source of new capability. He stressed that his office was committed to work with programs and offered his assistance in meeting small business objectives.

Day 2 Luncheon Speaker

Dr. Daniel Goldin, Administrator, National Aeronautics and Space Administration (NASA), provided the Day 2 luncheon address. Goldin presented a very candid assessment of contracting issues in NASA and throughout the federal government. He also discussed the re-

structuring and downsizing efforts within NASA and gave a status report on the transformation of NASA's mission design and acquisition processes.

Following Goldin's presentation, Gansler moderated a panel of the Service Acquisition Executives:

- David Oliver, Principal Deputy Under Secretary of Defense (Acquisition, Technology, and Logistics)
- Paul J. "Page" Hoeper, Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
- William J. Schaefer, Deputy Assistant Secretary of the Navy (Research, Development, and Acquisition), substituting for Lee Buchanan, Assistant Sec-

retary of the Navy (Research, Development, and Acquisition)

- Lawrence Delaney, Assistant Secretary of the Air Force (Acquisition).

After individual opening remarks, panel members answered questions from the conference attendees. Gansler closed the conference with thanks to the conference planning team, presenters, and all the attendees for making this another very successful PEO/SYSCOM Commanders' Conference.

Editor's Note: Presentations from the conference are available at: <http://www.acq.osd.mil/dsac/conferen.htm>.

DoD High Performance Computing Modernization Program

USERS GROUP CONFERENCE 2000

The DoD High Performance Computing Modernization Program (HPCMP) Users Group Conference will be held in Albuquerque, N.M., June 5-9, 2000.

The Office of the Secretary of Defense is investing a significant amount of funding in high performance computing to provide the U.S. military with a technological advantage to support warfighting requirements. The DoD HPCMP provides advanced hardware, computing tools, and training to DoD researchers utilizing the latest technology to aid their mission in support of the warfighter. The incorporation of high performance computing into the system design process allows the United States to maintain its technological supremacy in weapons systems design into the foreseeable future. The use of high

performance computing in the early stages of the system acquisition process aids in decreasing the total life cycle costs of fielding new warfighting support systems.

The program has three initiatives:

- High Performance Computing Centers – Major Shared Resource Centers and Distributed Centers
- Networking – Defense Research and Engineering Network
- Software – Common High Performance Computing Software Support Initiative

This program is under the cognizance of the Deputy Under Secretary of Defense for Science and Technology.

For more information, visit the conference Web site at:

<http://hpcmo.hpc.mil/Htdocs/UGC/index.html>

Program Manager 1999

A Quick Reference for Last Year's Articles

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The "Dinosaur Killer"

An Overwhelming, Unavoidable Force of Nature Changing Climate of World's Workforce — Its Name: "The Information Revolution"

Janice R. Lachance, Director, U.S. Office of Personnel Management, spoke at the 1999 U.S. Air Force Civilian Personnel Workshop Oct. 13, 1999. This article presents key excerpts from her remarks, emphasizing workforce learning, development, and education.

We have spent so much time getting ready for the new millennium that we may have lost sight of the fact that we are already in the midst of a time of dramatic change.

How we lead this change will mean the difference between success and failure as a federal workforce.

The "Dinosaur Killer"

People talk all the time about the impact of this change on our workforce and our society. I am here to tell you that the impact is already being felt — it is real, it is significant, and for those caught unaware, it will be catastrophic.

Lately, I have been talking about something that I call the "Dinosaur Killer" — and no, I'm not talking about some giant asteroid striking the planet, as recent movies have suggested.

Instead, I am talking about an overwhelming, unavoidable force of nature that is changing the climate of the world's workforce and ushering in a new age — this time we are

calling the Dinosaur Killer by the name of "The Information Revolution."

More and more information is becoming available to an ever-expanding number of people around the world at an ever-increasing pace. New technologies, new work environments, new needs for skills and learning — all these changes are having a deep impact, at work and at home, in societies around the globe.

And rest assured, the demands of the Information Revolution will kill our 20th century dinosaurs — those organizations that cannot, or will not, adapt to the new global realities of the next millennium.

At OPM, we have been working hard to fight off the Dinosaur Killer by anticipating the specific nature of work and the workforce of the 21st century, and by seeing what OPM can do now to create and sustain learning environments.

Adapt or Be Pushed Aside

We already see the trends for the next millennium. And the theme is "Adapt or be pushed aside."

Organizations are already learning that they must adapt to changing missions

and become more diverse and more flexible.

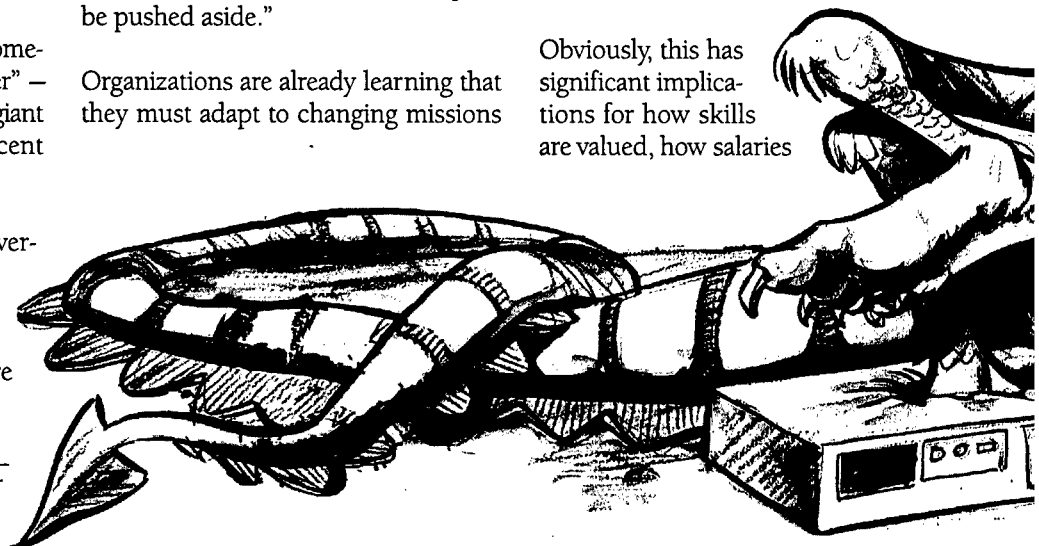
Situational Workforce

In the years ahead, organizations will no longer have a permanent workforce, or even a temporary workforce; instead they will have what I call a "situational workforce." Needed work will be done by a blend of core employees in cross-functional teams and by temporary employees, consultants, and contractors, when necessary.

Full-time, lifelong jobs and job descriptions are already disappearing, and instead, employees are increasingly being called upon to be generalists — omnivores in the new world order, with the tools to survive and flourish at many different tasks and in many different environments.

Fewer jobs will fit into a neat job description. And our core government employees will be called upon to perform one role today and another tomorrow.

Obviously, this has significant implications for how skills are valued, how salaries



Editor's Note: This information is in the public domain at <http://www.opm.gov/speeches/1999/usaf1099.htm>.

are set, how performance is evaluated, and how learning needs are assessed and met.

Organizations will have to look at the bottom line and weigh the cost of investing in specialists who can only do one thing very well, versus the benefit of using generalists who can perform multiple tasks and who are adaptable to changing organizational needs.

Work Processes Changing

The way work is organized is also being affected by the speed of change. Work processes are increasingly driven by what employees know — that is to say, how the work is done is increasingly dependent upon the level of knowledge the employee brings to the job.

The more knowledgeable an employee is across disciplines, the better job she or he can do, and the more valuable she or he becomes.

The result of this trend is that the distinction between working and learning is becoming blurred — part of every employee's job will be to keep learning about the ever-changing work to be performed. The Clinton/Gore Administration realizes this, and has made lifelong learning a priority in its efforts to improve the federal workplace.

Decentralized Operations, Decision Making

Another trend we see is that federal government operations and decision-making authority will continue to be decentralized.

For example, we are working to promote partnership and empower front-line employees to give them a greater say in problem solving and workforce improvements.

We must find ways to promote the potential of our employees — making them more knowledgeable, more adaptable, and better able to meet changing needs.

The fact is, I remain committed to developing the full potential of our current workforce. It is good for the employees, good for morale, and good for the bottom line.

Shift in Organizational Structures

Another change we will see is that federal agencies will shift from the hierarchical, Industrial Era structures that we are familiar with to "inter-networked" structures that improve and integrate service delivery and improve the design of government.

We are moving from the ponderous organizational dinosaurs of the 20th century to the fleet and nimble gazelles of the 21st. In the military, this is being seen not only in a new emphasis on more mobile fighting forces and "Rapid Deployment Forces," but also in leaner organizational structures and simplified lines of communication.

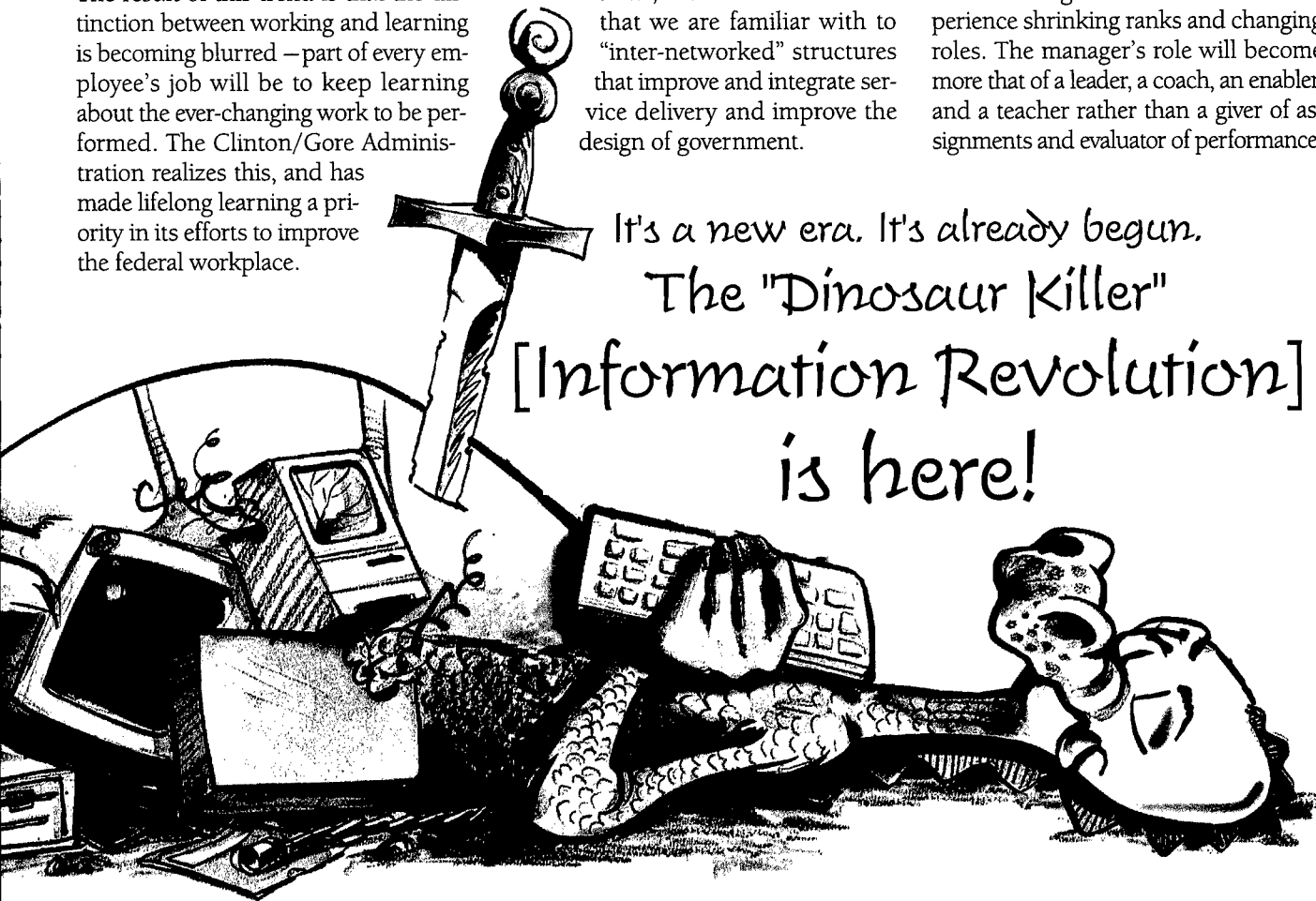
On Call 24-7

Where and when work is accomplished will increasingly be driven by customer and employee needs. The growth in telecommuting and working from home will continue as well as expanding traditional work hours to meet the needs of our customers — customers who have their own work schedule and family obligations. As Department of Defense employees, this is not news to you — DoD is always ready anyway, 24 hours a day. Now the rest of us are learning what it's like to be on call 24-7!

Manager's Role Changing

Middle management will continue to experience shrinking ranks and changing roles. The manager's role will become more that of a leader, a coach, an enabler, and a teacher rather than a giver of assignments and evaluator of performance.

It's a new era. It's already begun.
The "Dinosaur Killer"
[Information Revolution]
is here!



JANICE R. LACHANCE

Director, U.S. Office of Personnel Management

Janice R. Lachance is the Director, U.S. Office of Personnel Management (OPM). She was sworn-in as Director by Vice President Al Gore Dec. 10, 1997, after a unanimous confirmation by the U.S. Senate Nov. 9. At the swearing in ceremony, the Vice President called Lachance "the voice of fairness for federal employees and for excellence in government, and a champion of working people everywhere."



The U.S. Office of Personnel Management is the federal government's human resources agency. While daily providing the American public with up-to-date employment information, OPM ensures that the nation's civil service remains free of political influence and that federal employees are selected and treated fairly and on the basis of merit. OPM supports agencies with personnel services and policy leadership including staffing tools, guidance on labor-management relations, preparation of government's future leaders, compensation policy development, and programs to improve workforce performance. The agency manages the federal retirement system, as well as the world's largest employer-sponsored health insurance program serving more than nine million federal employees, retirees, and their families. In addition, the agency oversees the Combined Federal Campaign (CFC) through which 4.2 million federal civilian employees and military personnel raise millions of dollars for thousands of charities every year.

As director, Lachance oversees the agency's workforce of 3,700 employees and has an annual budgetary authority of approximately \$27 billion composed of discretionary and mandatory requirements. She also has responsibility for the administration of the federal retirement, health, and insurance programs that total about \$488 billion.

Lachance is the Chair of the National Partnership Council and the President's Task Force on Federal Training Technology. She is also a member of the President's Management Council; the President's Commission on White House Fellow; the Presidential Task Force on Employment of Adults With Disabilities; the President's Interagency Council on Women; the Planning Committee Forum for Health Care Quality Measurement and Reporting; the Inter-Departmental Council for Hispanic Educational Improvement; and the Advisory Committee on Veteran's Employment and Training.

Prior to becoming the agency's director, Lachance was appointed OPM's Director of Communications in 1993 and its Director of Communications and Policy from 1994 to 1996, where she was the agency's primary spokesperson with national and local media; and directed media relations, public affairs, marketing and internal communications, overseeing a staff of 24 and a budget of \$2.8 million. Lachance subsequently served as OPM's Chief of Staff from 1996 — 1997. She was appointed deputy director by President Clinton in August 1997 and served briefly in that position before assuming the position of acting director.

An attorney, Lachance's career includes work with federal agencies, congressional offices, and labor unions. From 1987 until she came to OPM, she served as the Director of Communications and Political Affairs for the American Federation of Government Employees, AFL CIO, where she directed the political, media, and public affairs programs for the nation's largest federal employee union.

Her early career includes extensive congressional experience, including Communications Director for Congressman Tom Daschle (D-S.D.), Administrative Assistant to Congresswoman Katie Hall (D-Ind.), and Staff Director and Counsel for the House Small Business Subcommittee on Antitrust and Restraint of Trade.

Born in Biddeford, Maine, Lachance holds a bachelor's degree from Manhattanville College, Purchase, N.Y., and a Law degree from Tulane University School of Law, New Orleans, La.

In other words, they either grow the wings they need to survive, or they will become extinct.

But, through all of this, we must ensure that we never as an organization lose sight of the people involved. The business of government is still the business of people helping people, after all.

With that said, let me offer some words of caution:

Work Division, Skill Obsolescence

We have to guard against work being divided into smart jobs and dumb jobs, thus dividing the workforce and society into "haves" and "have nots."

We will have to cope with skill obsolescence that leads to job displacement and organizational restructuring.

Employee Privacy

Our increased capability to monitor employees by computer may erode their rights to privacy.

Learning — An Economic and Pocketbook Issue

In addition, information technology also provides an example of a workforce learning need. Technology literacy is required in almost all occupations, and this constitutes a special challenge for us in keeping employees up-to-date on current applications.

In fact, for the individual, survival and success in the distributed, high-tech workplace depends on her or his ability to learn, unlearn, and relearn.

That, in and of itself, is quite different from past workplace learning and development challenges.

Workers' values are also changing in America. Workers may be loyal to their profession, but as their employers become less loyal to them, they are also becoming far less loyal to the organizations they work in than they were a generation ago.

One element of this phenomena is that workers have come to expect that their

employer should address their learning needs. And, they will choose those employers that provide them with the most educational opportunities.

Learning has become an economic and pocketbook issue for employees, and unions are increasingly interested in the training needs of employees.

These trends in the nature of work and in the workforce constitute significant challenges for workforce learning, development, and education.

Creating, Sustaining the Learning Environment

You are probably asking yourselves, what is OPM doing to create and sustain a learning environment in the federal government?

Workforce Planning

Because learning and continuing education are so important today, OPM is encouraging federal agencies to increase their use of workforce planning. We want agencies to do a better job of forecasting skills changes and anticipating workforce trends and needs.

Linking Training Priorities to Performance Objectives

Agencies must use learning as a strategic management tool throughout the organization, and change how training and learning are managed in federal agencies, so that training priorities are linked to performance objectives and training decisions are linked to performance development.

We are encouraging agencies to forge learning and performance development partnerships among various occupational groups, managers, employee representatives, and the human resource development community to develop resources and support for improved organizational performance.

Maximizing Use of Technology in Learning Programs

We are also actively encouraging agencies to use technology in their training and organizational learning programs, and support federal learning technology

"Because learning and continuing education are so important today, OPM is encouraging federal agencies to increase their use of workforce planning. We are also actively encouraging agencies to use technology in their training and organizational learning programs, and support federal learning technology consortiums that effectively share resources."

consortiums that effectively share resources.

Lifelong Learning

And we are committed to providing lifelong learning for every federal employee.

So, how do we plan to prepare federal workers for the new millennium?

Well, as we look at the direction being provided by the Clinton/Gore Administration, we find confirmation that human resources development is the re-

sponsibility of the entire organization — and it is a lifelong process.

Two current administration initiatives illustrate this point.

INDIVIDUAL LEARNING ACCOUNTS

Earlier this year, the president issued an Executive Order for the Heads of Executive Departments and Agencies titled, "Using Technology to Improve Training Opportunities for Federal Government Employees."

Its purpose is to organize and promote the use of technology to enhance learning in the federal government. It establishes a Government-wide Task Force, which I chair, and a private sector Advisory Committee.

The Task Force is made up of federal leaders who are working to craft recommendations on how we can effectively integrate technology into the training of the federal workforce.

In July, I was very pleased to sign the Task Force's initial set of recommendations on Individual Learning Accounts for federal employees, [who] were on a fast track. For those of you who haven't heard about Individual Learning Accounts, they are resources — either dollars or hours — set aside for individual employees to use for their professional development and learning.

Soon, we expect the president to endorse these recommendations, and we will work with a number of agencies to establish Individual Learning Account pilots. The results of these pilots will serve as the basis for OPM's government-wide guidance for agencies [that] choose to implement such accounts. We make our remaining recommendations to the president in July 2000.

ADVISORY COMMITTEE ON EXPANDING TRAINING OPPORTUNITIES

To complement the work being done by the Task Force, the president also directed OPM to establish an Advisory Committee on Expanding Training Opportunities.

The Committee will be appointed by the president and will be made up of private-sector representatives – from research, education, labor, training, and information technology.

They will make an independent assessment of how the federal government is doing in integrating technology into training programs; how federal government programs, initiatives, and policies can drive training technology so that all Americans have training opportunities; and how the federal government can encourage private-sector investment in the development and use of high-quality instructional software.

They will also look at what the federal government's role should be in research and development for learning technologies; and what the options are for helping adult Americans finance the training and post-secondary education needed to upgrade skills and gain new knowledge.

Whether we invest in our employees is no longer a question. The question is how. One of the "best" right answers is: use technology to design, develop and deliver training government-wide.

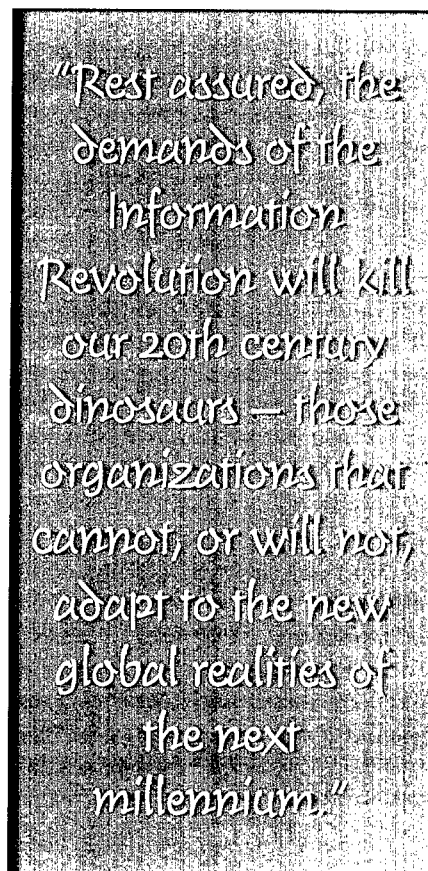
The Task Force and Advisory Committee will give us a road map. All we will have to do is follow it.

This Task Force is a powerful example of our efforts to muster federal resources and new instructional technologies to make education, at work and at home, easier and more convenient for the federal workforce.

This Federal Learning Technology Strategy came out of the Vice President's Lifelong Learning Summit, which took place last January.

This event heralded a vision and call to action for lifelong learning for all Americans.

Vice President Gore told the group, "Realizing our potential will require investing in education and learning for all of our people throughout their lifetimes."



So, we must ensure that the federal government's policies regarding employee training apply to every employee. And I believe we are on the right track.

Cooperation Between Labor And Management

This Administration also understands that cooperation between labor and management can be a powerful vehicle for improving the performance of government. At agencies like the U.S. Mint, the Department of Veterans Affairs, the Social Security Administration, and the Customs Service, partnerships between labor and management are saving millions of taxpayer dollars and dramatically improving the delivery of service.

That's what the President's Executive Order on partnership is all about: labor and management working together to make the government work better for the American people.

As the administration looks to renew its commitment to partnership, OPM is eager to play a strong leadership role. We will do everything we can to help

agencies and unions find better, more effective ways of conducting business. Building successful partnerships is not easy, but training, education, and facilitation can make all the difference in the world, and OPM will work hard to make sure that agencies and unions get the resources they need to succeed.

I continue to believe that unions and agencies have a common interest in delivering the best possible service to the American people, and OPM will do its very best to help stimulate the creation of true workplace partnerships where that can be achieved.

Giving Agency Managers Tools, Strategies They Need

As the federal workplace changes, OPM is responding with new tools and strategies to provide agency managers with greater flexibilities for recruitment, performance management, and retention tools.

We have been working hard to provide those tools over the last decade. We have introduced many changes that have made a real difference in these areas. For example, the delegation of examining to agencies, an automated database of all government jobs that is open around the clock, and a flexible framework for performance appraisal that supports individuals and teams.

But our job is not done. We need more tools and strategies that meet the challenges of today's workplace.

At the beginning of this year, Vice President Gore announced his commitment to civil service improvements at the Global Forum on Reinventing Government. The essential components of these improvements are twofold.

First, we must have flexible performance and pay systems that support high performance, and encourage employees to do their best; and, second, we have to be able to create flexible recruitment and hiring systems that permit alternative selection procedures, authorize agencies to make direct job offers in critical areas – like information technology – and per-

mit use of nonpermanent employees, with appropriate benefits, to expedite adapting to workload and mission shifts.

For the most part, these improvements are offered as options to agencies. Working with their employees, agencies can choose which new tools and strategies best fit their needs.

Many of these have been tested and found to be effective in demonstration projects and in the private sector. It is time that they were made available to all federal managers.

Of course, each new tool or strategy is designed to work in the context of our merit principles, so that agencies can continue to ensure that the very best workers are hired, rewarded, and retained.

ACCOUNTABILITY

Along with these proposed flexibilities for managers to select and manage the high-quality, diverse workforce they need, we are also introducing real accountability.

This accountability translates into more emphasis on performance measurement, and ultimately, it also translates to improved recognition and rewards.

Let me be frank. All stakeholders have an equal stake in embracing these changes in the civil service. I can assure you that the merit system will remain the basis of all our improvements, but we cannot be afraid to try new things and experiment with new processes.

CONFRONTING APPREHENSIONS, EMBRACING OPPORTUNITIES

One of our challenges is to assist each stakeholder to confront their apprehensions and embrace the opportunities that this package offers. It is up to us to change the way we do business, and [then] reap the improvements in service that will follow.

We must embrace increased partnership as a means of accomplishing these changes. With partnership comes more creativity and productivity, and ultimately, better service to the public.

So, building consensus is essential to the success of our civil service improvement efforts. We have pledged to move forward together. That means the process takes longer, but we intend to carry on the process as long as it takes.

Our mission is too important, our opportunities too great to accept anything

less than constructive engagement and cooperation.

Emphasis on Adaptability, Innovation

I realize that we cannot anticipate every change the future holds, but I also know that by emphasizing adaptability and innovation, we will be better able to adjust to any surprises the future may hold for us.

At OPM, we are not afraid to try new things and experiment with new processes. I encourage you to do the same.

It's a new era. It's already begun. The Dinosaur Killer is here. So, I have one simple piece of advice for you — don't be a dinosaur. Be nimble. Adapt. Don't be afraid to change. In the long run, it is not only in the government's best interest, it is in your best interest.

I look forward to continuing to share ideas and innovations with you, as we each create a new, more global workforce — built on the lessons of the past, the innovations of the present, and the needs of the future — to help our government move successfully into the 21st century.

YOU ARE INVITED!

Interested DoD-Industry Personnel, DSMC Graduates, Faculty, Staff



The Capital Area Chapter, Defense Systems Management College Alumni Association (DSMCAA) sponsors monthly "brown bag" acquisition seminars on timely acquisition subjects, featuring experts in the subject area. Seminars are open to interested DoD personnel; DSMC graduates/alumni and faculty; and DoD contractor personnel,

subject to prior notification of attendance. Seminars are normally scheduled on the fourth Monday of each month from 11:30 a.m. to 12:45 p.m., and are held at the following new location:

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Individuals planning to attend a seminar should E-mail Tod Beatrice at beatrice@anser.org or call (703) 588-7747 no later than one work day prior to the seminar. If replying by voice mail, please provide your name, company/organization, and phone number.

To learn more about the great benefits of DSMCAA membership, visit the DSMCAA Web site at <http://www.dsmcaa.org>.

Systems Engineer Advocates Gradual Elimination of Progress Payments

The following is my position, in imprecise laymen's terms, based not on formal statistical analysis, but on my own personal experience. I believe that the U.S. Government contract policy of issuing progress payments on fixed price contracts results in a loss of quality and efficiency.

In the United States and in other countries, the value of a company is determined by the free market economy. A company, its owners, and its employees are directly and indirectly motivated by stock price. In general, the owners of a company are the stockholders.

Historical stock prices for companies have an extremely high correlation to the historical predictions of earnings for that company. It can be speculated that the current stock price for a company is based on the present analyst(s)' prediction(s) of present and future earnings for that company. Earnings — past, present, and future — can be significantly impacted by leverage.

Financial leverage and physical leverage are fundamentally the same. Just as one might use a crow bar or lever to increase the effectiveness of one's physical strength, companies use financial leverage to increase their earnings strength. Financial leverage is obtained by using other people's money.

In the free marketplace, for nongovernment contracts obtaining debt provides leverage. Liability, which is capital proved by debt, leverages equity, which is capital provided by owners. Having more money increases a company's total assets and allows the company to do more work and obtain more return. The more assets a company has, the

better the company's chances are to be able to make a higher profit. Assets equal total liability plus total equity. In other words, "It takes money to make money."

Earnings are tracked and predicted in the form of earnings per share. Earnings per share is a ratio of total profit to only the equity portion of total assets. Since earnings per share is a ratio of total profits made from both liability and equity to only equity, earnings per share can increase significantly by increasing the amount of capital that is provided by liability.

Owners can increase the earning power of their money through the use of financial leverage, obtained from the capital market as debt. In the free market not influenced by government progress payments, leverage is obtained through debt. Free market, nongovernment contract companies borrow money via banks and bonds. These companies must pay interest on that money. In order for this to be profitable, one could logically deduce that these companies must achieve two very important things, or they may go bankrupt:

- First, these companies must produce and deliver a high-quality product that their customers want or they will not obtain the funding required to repay their debts.
- Second, these companies must produce their product in an efficient manner. To increase earnings per share through the use of leverage, these companies must be efficient enough so that the profit on the funds that they borrowed is greater than the interest they must pay on the funds

that they borrowed. This is a significant efficiency driver.

In the government contracts marketplace, a significant amount of leverage, sometimes as much as 80 percent of the total contract value, is obtained from the government in the form of progress payments. The government often provides a majority of the total price for the product before receiving the final working product. For many contracts, this ends up as debt-free, interest-free money for the company. In this marketplace, a company can still be profitable without taking the actions discussed earlier.

These companies no longer need to produce a high-quality product to ensure that it sells. Three good reasons for this follow:

- First, the company does not need to provide a quality product in order to receive the majority of payment from the government, because the government has already paid the company the majority of the total price in the form of progress payments.
- Second, by the time the contractor is ready to deliver, they are no longer required to deliver a top-quality product to obtain funds to repay funding used as their investment capital. This is because a large part of their investment capital has already been provided to them in the form of progress payments. Therefore, there is no need to deliver a quality product to produce capital to repay creditors to whom they would otherwise still be indebted.

- Third, for many reasons, including the recognition that in most cases the government has already paid the company most of the available money for the product, most government agencies no longer have the leverage to enforce delivery of a quality final product from the company.

- Fourth, these companies are not required to produce their product as efficiently because the funds they received from the government prior to final delivery are interest-free. Therefore, any amount of return or profit on this funding leads to higher earnings per share.

In government contracts, companies do not have to be as efficient to make a profit.

Although I would not advocate an immediate termination of progress payments, I would suggest a study to determine if it would be beneficial for government agencies to implement a policy that would gradually eliminate the use of progress payments.

Efficiency is the result of necessity. The free market creates necessity. When it comes to leverage, the government should no longer interfere with the free market.

Cosmo Calobrisi
General & Systems Engineer
Air Armament Center
Eglin AFB, Fla.

In the Nov/Dec 1999 of *Program Manager* magazine, Paul Mcilvaine provides an excellent and valuable "road map" of the current DoD 5000 Series, summarizing the materiel acquisition life cycle process ("The Acquisition Chart," p. 38).

However, this article neglects to present the recent, much-touted, and well-publicized new materiel acquisition "initiative" of system Performance Specification-based Production.

This new procurement practice is illegal by FAR [Federal Acquisition Regulation] and DFARS [Defense Federal Acquisition Regulation Supplement] and other Laws and Statutes. It contradicts the theme and details of the DoD policy as described in this article. It attempts to violate fundamental scientific principles of design, producibility, and production engineering. It ignores principles and requirements for safe, quality, and effective modern manufacturing. It is extremely costly, provides no benefits to the government, and results can be highly dangerous to materiel producers and users (e.g., recent grounding of the Apache helicopters).

Nevertheless, this interesting and novel acquisition initiative is here. I respectfully and personally propose that it should have been included and presented as an "alternative," a less bureaucratic "road map." Especially so since this unofficial practice is claimed to fall under DoD's acquisition reform, streamlining, and reinvention initiative.

Harold Chanin
Picatinny Arsenal, N.J.

DoD Concerned About Defense Industrial Base

JIM GARAMONE

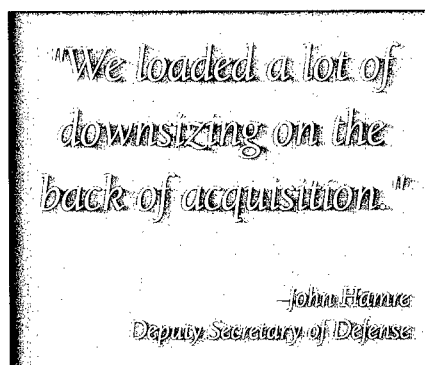
WASHINGTON (Nov. 8, 1999) — DoD must work to improve the health and well-being of the defense industrial base, Deputy Defense Secretary John Hamre said.

Hamre spoke here Nov. 3 at the Strategic Responsiveness Conference, sponsored by the Army and the Tufts University Fletcher School of Law and Diplomacy. He said he is concerned the stock market "has pummeled" defense companies in recent weeks.

The stock market, he remarked, seems more concerned with quarterly earnings than long-term company health — and the consequence of investor shortsightedness is that managers make bad long-term decisions to look good for the next quarter.

"Who's going to defend this country 10 years from now and 15 years from now?" he asked rhetorically. "It's going to have to be these companies who we work with, who we need. All of us in DoD are indispensably tied to health and well-being of our partners in the private sector."

Hamre said defense companies must resist the urge to cut overhead by cutting research and development funds. Finally, he said, Wall Street may reward companies that cut costs by downsizing, but DoD must ensure the slashing doesn't bleed the industrial base of badly needed scientific and managerial talent.



He detailed some principles the Department must follow if it is to support defense contractors. First, the government must provide steady, stable defense budgets that allow defense companies to plan work, costs, and personnel.

"We loaded a lot of downsizing on the back of acquisition," he said. "There comes a point where you can't lose the design and engineering expertise we have invested in through our private sector. We are at that point."

Second, DoD must emphasize stability, he said. "We've got to promote multiyear contracts that mean stable programs managers can count on."

Third, DoD must be careful about its acquisition practices, Hamre said. "We have to eliminate policies that put all the risk on our partners in the private sector," he said. "It is a partnership. We have to manage it together."

Hamre said the company consolidations in the U.S. defense industrial base — especially at the prime contractor level — have gone about as far as they can go. DoD will look hard at company mergers because "we're at a point now where we're losing competitive opportunity

with concentration," he said. DoD will apply tough tests for companies that seek to merge.

"We can't afford to slip by default into a sole-producer world," he said.

Hamre said he believed "trans-Atlantic megadeals" between defense companies is in the cards for the future, but not now.

"The technological gap between us and our very good allies is widening," he said. "Alliance interoperability has become an enormous challenge for all of us. We're not going to be able to keep the alliance together technologically unless we find ways for greater collaboration between our industrial sectors."

Even with these considerations, he said, the United States and its close allies do not have in place the security infrastructure needed before such mergers can take place. "We're close with some countries like the United Kingdom, but we're not there yet," he said.

Hamre said now is a time for real change. "For the last 10 years, we really haven't stood back and asked how should we shape our future," he said. "In those wonderful days after the fall of the wall, it looked like such a glowing future. We thought it would be so different," he said. "It's so much more challenging and complicated now. Certainly in those days we didn't have the vision we now have, and even now we don't see terribly clearly all the details of the new landscape."

"This is a historic opportunity for us to make a new future," Hamre concluded. "This future is ours to make, but is also ours to lose if we don't step up to this opportunity."

Editor's Note: Garamone is on the staff of American Forces Press Service. This information is in the public domain at <http://www.defenselink.mil/news>.

Standing Up or Joining an International Program Office?

Some Nitty Gritty Details You Might Need to Know

COL. ALAN E. HABERBUSCH, U.S. AIR FORCE, RET.

So you're going to lead or be part of an international program office (IPO). Let me take you back to 1987 and tell you about my experience when I worked on an international cooperative program — the Modular Stand-Off Weapon (MSOW). As program director, I found a reasonable amount of assistance and information on developing a Memorandum of Agreement (MOU) and "big picture" management of such programs, much of which is covered in the Defense Systems Management College (DSMC) International Program Management courses. What is not readily available, I discovered, is greatly needed but hard-to-find *insight* into the detailed aspects of such an effort.

In this article, I describe some of these details I had to manage from my perspective as program director. As you read through the article, you will find, as did I, that no "one size fits all"; nor are there any magic "cookbook" solutions for international cooperative programs. What I hope you glean from this article is an appreciation of some of the things you may encounter and how we handled them in the MSOW IPO.

Getting Started

First, some background. The MSOW was originally a seven-nation (later five-nation) collaborative effort under a General MOU signed in July 1987.¹ This MOU had the basic "rules of the road" but did not commit anyone to spend any money. Each phase was to be further de-

fined by a supplementary MOU that would contain a financial annex and, when approved through the national approval process and signed by the appropriate officials, would commit that nation to that phase of the program.

When I came to the program in September 1987, the Project Definition (PD) Phase MOU was being negotiated.² The text was agreed upon by November 1988, and the program office used it as a directive. Eventually, the Management Group approved the financial annex, but the MOU was never signed.

The program was set to enter the PD Phase [NATO terminology], which would be equivalent to the current Program Definition and Risk Reduction Phase (Demonstration/Validation Phase in the MSOW time frame). Program management was a three-tier international structure with a Steering Committee at the top (a two-star/civilian equivalent membership), a Management Group (colonel/civilian equivalent membership), and an IPO at the bottom. For the top two groups, this structure put all the participants in an equal position.

MSOW was unique in that it began the collaboration on a major system much earlier in the development process than did the more familiar F-16 and Airborne Warning and Control System (AWACS) programs. MSOW had to build its day-to-day management structure (the IPO)

Haberbusch spent 27 years in the research, development, acquisition, and test field (1964-91), including assignments in the space, aircraft, and munitions systems areas. He is currently working as a contractor under the Technical and Acquisition Management Support contract at Air Armament Center, Eglin AFB, Fla. He is a graduate of PMC 76-1, DSMC.



No "one size fits all";
nor are there any magic
"cookbook" solutions for
international cooperative

programs

from scratch. This was necessary because MSOW had no infrastructure already in place, such as the F-16 System Program Office (SPO) or the AWACS SPO, to aid in its collaborative efforts.

A Home for the IPO

The PD Supplement MOU identified the United States as the host nation and Eglin AFB as the location of the IPO. The IPO was therefore an international ten-

ant on Eglin AFB. This particular agreement was different than the usual agreement the base had developed for other tenants because of the non-U.S. Government nature of the IPO. Therefore, it took considerable time and several iterations to get all the items included that were needed. The final iteration was not completed before the United States withdrew, the program ended, and the IPO disbanded.³ The IPO operated on Eglin without a formal agreement for over three years.

The construction of a building for the MSOW was another aspect of defining a home. The initial direction to the host base through a Program Management Directive was to construct a modular relocatable building whose "funded cost" was not to exceed \$200K. It took me some time to get someone in the civil engineering community to define funded cost, but it meant that this was the cost ceiling for all the site preparation work.

After that, as much could be spent on the structure itself as was desired by the funding agency. As it turned out, a later ruling stipulated that the structure cost was not an appropriate expenditure for U.S. MSOW program funding. This delayed the construction process until funding was sorted out. Because funding was delayed about five months — a potentially embarrassing situation for the United States — it took action by the Commander, [then] Air Force Systems Command with the Secretary of the Air Force to obtain release of emergency funding.

The building was eventually finished, taking about twice as long (eight months) as originally envisioned. By that time, the U.S. withdrawal had terminated the program. While the IPO was in existence, it temporarily occupied existing buildings at Eglin AFB.

Organization, Staffing, and Other Personnel-Related Items

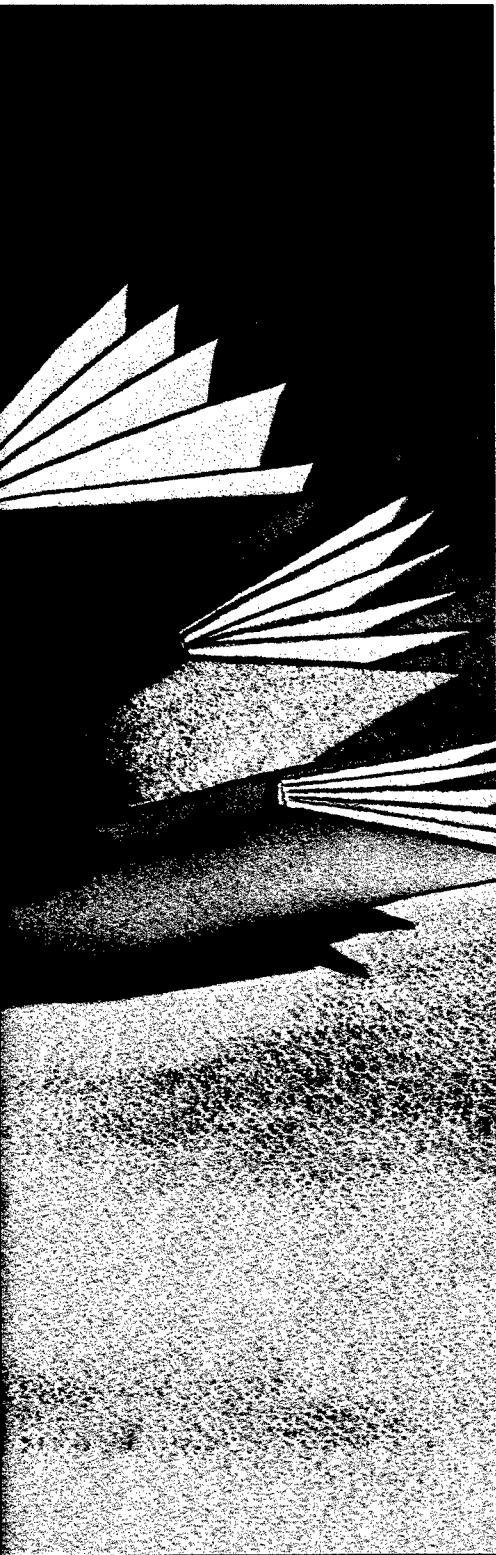
The IPO would be staffed by the participating nations in consonance with their financial contribution. So if a nation contributed 20 percent of the fi-

nancing, it would provide 20 percent of the approved staffing for the IPO. First, opinions differed on how many people it would take to properly staff the IPO. Depending on the nation, the numbers varied from six to 40. The compromise was 28 from the nations, with direct support staff (U.S. personnel funded by the participants) providing specialist expertise (e.g., contracting) or administrative support (e.g., secretarial).

The second task was to determine how the 28-member IPO would be organized and who would provide personnel to fill what positions. Two personnel selections were decided up front: the program director (United States) and the deputy director (United Kingdom). As the program director, I worked with my deputy to define the organization structure. For the remaining 26 members of the IPO, it was fairly easy to come to agreement on the functions and distribution of personnel.⁴

Third, we had to answer two questions: What countries would provide the chiefs of the various functions; and what countries would provide the working level in each function? The former question turned out to be politically "sticky" because we had more countries than chief positions (not counting the director and his deputy). This had to be resolved by the Steering Committee and was only resolved when one participant agreed not to seek a chief position but instead was granted preference for certain other positions.

As for the working level, we came up with a process where each participant offered to fill certain positions. In almost every case, we had more offers than positions.^{5,6} At this stage, particular individuals and their qualifications were not put forward. This never came to final resolution because the program did not go forward. In hindsight, we most certainly would have considered each offer based on individuals and their qualifications, while keeping in mind that each nation had to provide a certain number of people to meet their commitment. Again, this would have been a politically sticky job at best.



An additional factor was that some nations were not prepared to assign their personnel to the IPO permanently until their respective countries approved the PD Supplement MOU. Notwithstanding, there were exceptions — the British deputy and the total German contingent became permanent members of the IPO as soon as we defined and obtained approval on the IPO structure. However, all nations fully supported the source selection process with temporary duty personnel, as required.

The direct support positions presented another interesting challenge. The direct support concept was to hire U.S. employees on term positions. (We could establish a term position based on the fact that we had known funding available over a specific period to do jobs only a U.S. employee could do [contracting] or where it made more sense that a U.S. employee perform the task [secretarial/administrative].) The participating nations would share the costs of these positions in the same way that they shared other program costs. While the IPO encountered no problem when these positions required someone full time, part time was a problem. For part time, the only way to get needed support was to have an existing, authorized, and filled U.S. position and reimburse for the actual use. This created a problem in two ways.

- First, when the particular specialty already had its currently authorized people fully engaged in other work, no way existed to establish a “partial term position” to cover MSOW needs.
- Second, even if the U.S. employees in the particular specialty were available to support the IPO, the United States was unwilling to accept “pay as you go” and wanted a minimum use guarantee. No good solution emerged for either of these problems, and again the overall approach was never tested due to program termination.

The last portion of the personnel area was performance reporting. Quoting the General MOU, “The Terms of Reference for the IPO will make clear that staff members are dedicated to the Pro-

gramme only and that Participants will not place other national tasks on their respective IPO members.” This, in essence, said everyone in the IPO is, as we say in the United States, “purple”; that is, representing everyone involved. To me, this clearly meant we needed a system of performance evaluation *inside* the IPO for our members. Since IPO members were administered by their respective home nations, we were mindful that this performance reporting must also “feed” the national personnel system of each of the five participating nations. Toward that end, I developed, presented, and gained approval of the Management Group for a system that had the following parameters:

- Immediate supervisor must be an integral part of the process.
- Process must lead to an accurate and fair reporting into the national systems.
- System must be based on task definitions.

For those IPO personnel below the division chief level, the Senior National Representative or SNR (the most senior person from a given country in the IPO) would brief supervisors on key aspects of the national system. SNRs would stay knowledgeable on the performance of their particular nation’s IPO members. To develop a task definition, reach agreement with the ratee on the task definition (IPO director and deputy review), observe and record performance, and provide feedback to the ratee, the supervisor would use the Terms of Reference for the position.

Next, SNRs would receive the supervisor’s performance evaluation of their respective nation’s IPO members and transpose the evaluations onto national forms peculiar to each country. Each form would then be reviewed with the ratee’s supervisor, the IPO director, and deputy. Finally, the supervisor would feed each evaluation into the national system of the ratee.

For those personnel at the division chief level, the system works the same, with the IPO director or deputy as the su-

pervisor. Similarly, the IPO director is the supervisor for the IPO deputy director. For the IPO director, the Management Group would provide an input to the officer evaluation reporting official who prepares the national form.⁷

National Approval Processes

During the life of the program, the five participating nations had their own approval processes for the MOU supplements. What drove these processes were the text and the Not-to-Exceed Cost Annex of the supplement. In most cases, the parliament stayed involved in the approval process. To assure a timely contract award, I needed to be confident that the approval processes could be successfully completed somewhere close to the end of the source selection process. As the program moved through the source selection process, I began to ask about the time lines of these processes.

During the source selection process, I looked into this situation and discovered that the topic of the national approval processes had been discussed at the Management Group before I came to the program; but somehow the discussion never reached a clear definition of each country’s process. These processes were on the critical path to a contract award, so I was finally able to convince the two-star Chairman of the Source Selection Advisory Committee and the four-star Chairman of the Source Selection Authority Committee to use their influence and force this topic onto the table.

The prior reluctance to get this in the open, in my view, was that no one wanted their nation’s process to be the “long pole in the tent.” All these approvals were in two stages: first, the signatures of the MOU supplement, and second the process to make the money available to the IPO. Once all the information became available, it showed that the key element was a four-month gap between the two parts for one of the countries, and that gap began just about when the source selection decision was due. What this told me was that we needed to get an agreement among all the other participants to front-load their funding and allow this trailing country

to back-load its funding; otherwise, we would have a four-month delay in the contract award. We did, in fact, get this agreement.

A Word From the Author

I provided all the documents listed as references to the DSMC International Department. In addition to these documents, three others (also supplied DSMC) contain additional information that may be helpful to U.S. personnel involved in international collaborative efforts:

- Munitions Systems Division History Office Interview of Air Force Col. Alan E. Habermusch, Program Director, MSOW IPO, Eglin AFB, Fla. 32542, Dec. 15, 1989.
- "Modular Standoff Weapon Management, the Programme Manager's Perspective," an article that appeared in

the magazine NATO's *Sixteen Nations*, April/May 1988.

- "The Modular Stand-Off Weapon, Federal Acquisition Regulation Waivers and Deviations in an International Acquisition," published in *Proceedings, 1991 Acquisition Research Symposium*, Volume II.

Editor's Note: The author welcomes questions or comments concerning this article. Contact him via E-mail at haberbus@eglin.af.mil.

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2. Supplement No. 1 to the Memorandum of Understanding Concerning the Collaborative Project Definition Phase of the Modular Stand-Off Weapon System, Draft, Nov. 10, 1988.

3. MSOW IPO/CC Letter, Jan. 24, 1990, Lessons Learned, Appendix 1, "Some Special Topics," Attachments 6-7, MSD/MSOW IPO Program Office Support Agreement.

4. MSOW IPO/CC Letter, Jan. 24, 1990, Lessons Learned, Appendix 1, "Some Special Topics," Attachment 3, MSOW IPO Organization.

5. MSOW IPO/CC Letter, Jan. 24, 1990, Lessons Learned, Appendix 1, "Some Special Topics," Attachment 2, MSOW IPO Organization in the PD Phase.

6. Addendum to Lessons Learned on Modular Stand-Off Weapon (MSOW).

7. Ibid.

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Twelfth Annual International Acquisition/Procurement Seminar — Atlantic (IAPS-A)



June 26–30, 2000

**Sponsored by the
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at the
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Shrivenham, United Kingdom**

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The Twelfth Annual Acquisition/Procurement Seminar — Atlantic (IAPS-A) focuses on international acquisition practices and cooperative programs. The seminar is sponsored by the International Defense Educational Arrangement (IDEA) between defense acquisition educational institutions in the United Kingdom, Germany, France, and the United States.

Those eligible to attend are Defense Department/Ministry and defense industry employees from the four IDEA nations who are actively engaged in international defense acquisition programs. Other nations may participate by invitation. Nations participating in past seminars were Australia, Belgium, Canada, Denmark, Ireland, Italy, Japan, The Netherlands, Norway, Portugal, Romania, Singapore, and Spain.

This year's seminar will begin June 26 at the Royal Military College of Science (RMCS), Shrivenham, United Kingdom. The last day of the seminar, June 30, will be an optional day for those interested in the educational aspects of international acquisition.

The IAPS-A is by invitation only. Those desiring an invitation, who have not attended past international seminars should submit a Letter of Request on government or business letterhead, to DSMC by fax. Qualified participants pay no seminar fee. Invitations, confirmations, and joining instructions will be issued after May 1.

For more information, visit the DSMC Web site at <http://www.dsmc.dsm.mil> or contact an IAPS-A Team member:

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The following information should be provided in your proposal application

Name and Title

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Title of presentation or paper

Abstract (Please limit to 250 Words)

The Acquisition Chart

A Road Map for Use by Program Managers Throughout the System Life Cycle

PAUL MCILVAINE

The increase in complexity of defense systems, coupled with rapid technological progress, requires the use of functional specialists who understand the technology, advocate "best practices," and execute necessary actions within the framework of their specific discipline. Concurrently, the need for interdisciplinary managers [a.k.a., generalists] to "integrate" the technology and "tie together" the efforts of these specialists toward common objectives remains just as great.

The Department of Defense has addressed this challenge by the use of the program manager — a single individual responsible for a defense system, supported by cross-functional teams composed of specialists and generalists. These teams are known as Integrated Product Teams (IPT). The best way to model this interaction is in the form of a matrix.

Intermediate groupings of functional specialists can assist in tying the technology together and facilitating smoother integration. Elvin Isgrig, in his 1984 study, "Integration: An Interdisciplinary Study of Project/Program Management," identified three intermediate groupings of specialists. Technical groupings generally consist of systems engineering; software; test and evaluation; manufacturing and production; and acquisition logistics. Business groupings usually consist of contract management and funds management. Administrative groupings can be expected to include acquisition policy; program management and leadership; and earned value management. Technical, business, and administrative managers are the key linkages between the functional specialists and generalists. Many program management offices organize themselves along the lines of these groupings.

A good analogy is that of an orchestra. Functional specialists who play violins, viola, and cello make up the intermediate grouping known as the string section. Add the woodwinds, brass, percussion, and horns; you then have all the components necessary to make up an orchestra. The score (Program Management Plan or Single Acquisition Management Plan) represents the common objective of each "player." The "concert-master or first chair of violins" [for example] performs "intermediate integration" of the violin section in support of the conductor. The conductor (or program manager) is responsible for overall integration of the efforts of each player and section. He or she strives to develop ensemble by working as a team to appropriately interpret the score. The measure of the orchestra (or how well the system performs) is in the harmony and synchronization of each element that performs "as one."

The Defense Systems Acquisition Management Process Chart ("The Acquisition Chart") is now in its Eighth Edition and serves as a pictorial training aid, visually depicting the policy guidelines in the DoD 5000 series of documents [coupled with "best practices"].

The rows represent the functional specialists who follow the process outlined for their specific discipline. The columns represent the total effort underway at each point in a program, and how the generalists attempt to "tie together" or "integrate" the ongoing work of the functional specialists. The entire overall process is known as Integrated Product and Process

Development (IPPD). In practice, IPPD development is accomplished by multiple IPTs.

"The Acquisition Chart" depicts the entire life cycle ("cradle to grave") of a nominal defense acquisition program. To optimize the overall system, program managers must understand the contributions of the functional specialists (rows) within the integrating framework of the generalists (columns). Thus, "The Acquisition Chart" serves as not only a road map for program managers to use throughout the system life cycle, but also a training aid/template from which to design a "real world" course in program management.

Team Lead

Paul McIlvaine

Team Members

Dr. Paul Alfieri • Bill Bahnmaier • Dr. Jack Dwyer • Dr. Bob Lightsey • Air Force Lt. Col. Dave Melton • George Proshnik • Navy Cmdr. Don Reiter • Sharon Richardson • Air Force Lt. Col. Harry Snodgrass

Design & Layout

Paula Croisetiere

Government personnel interested in obtaining a single, full-size (2' X 3'), full-color copy of the chart may fax their single copy requests on official stationery to: (703) 805-3726; or send a written request to the following address:

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Editor's Note: A smaller version of "The Acquisition Chart" appears on the following four pages. Also, another smaller version of the chart can be downloaded and printed from the DSMC Home Page in Acrobat as a PDF file. To download, go to http://www.dsmc.dsm.mil/pubs/chart3000/ch_3000.htm on the DSMC Web site.

McIlvaine is currently a Professor of Engineering Management, Logistics Management Department, Faculty Division, DSMC. A Project Leader for eight versions of the Acquisition chart, over 100,000 copies have been distributed since the chart's inception in 1984. The author wishes to acknowledge Maestro Ernest Green, Conductor, Annapolis Choral and Chamber Orchestra, for his assistance in preparing this article.

The Defense Systems Acquisition Management Process Chart

HOW TO OBTAIN COPIES

Military and government employees can obtain a single copy of this chart from the Publications Distribution Center in the basement of building 204 at the Ft. Belvoir Campus. A written request is needed for nonstudent requests. Please send requests to DSMC, ATTN: ASD, 9820 Belvoir Road, Suite 3, Ft. Belvoir, VA 22060-5565 or fax to (703) 805-3726. Multiple copies requested by government personnel must be purchased through the Government Printing Office (GPO). Nongovernment personnel must purchase one or more copies through GPO.

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I. INTRODUCTION

DSMC POC: Paul McVain; FD-LM; (703) 305-4660

The Defense Systems Acquisition Management Process Chart is a training aid for Defense Systems Management College (DSMC) courses and is designed to serve as a pictorial roadmap of functional activities throughout the Defense Systems Acquisition Life Cycle. This chart is based on the policies in Department of Defense (DoD) 5000 Series documents. These consist of DoD Directive (DoDD) 5000.1, as modified by change 1, *Defense Acquisition*, and DoD Regulation 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Program (MDAP) and Major Automated Information System (MAIS) Acquisition Programs*, as modified by changes 1-4 (inclusive). The *Defense Acquisition Deskbook* describes discretionary information and best practices in implementing defense acquisition. This chart is not a substitute for knowing these references.

Acquisition of a system is a process that begins with the identification of a need, encompasses the activities of design, test, manufacture, operations and support, may involve modifications, and ends with the disposal/recycling/demilitarization of that system. Upgrade (or modification) programs also follow the acquisition life cycle that includes the activities of design, test, manufacture, installation and checkout, and operations and support.

The primary objective of defense acquisition, stated in DoDD 5000.1, is to acquire quality products that satisfy the needs of the operational user with measurable improvements to mission accomplishment, in a timely manner, at a fair and reasonable price. Several important themes, promoted in the latest versions of these acquisition documents and in ongoing Acquisition Reform

efforts, are teamwork, tailoring, empowerment, cost as an independent variable (CAIV), commercial products, and best practices. Additional goals imposed on the DoD acquisition process include political, ethical, and economic goals.

To implement these varied themes and goals, many unique requirements, laws, and regulations are imposed on defense acquisition that still burden program managers in pursuing the efficiencies inherent in pure commercial acquisition practice.

DoD components shall first try to satisfy mission needs through nonmaterial solutions, such as changes in doctrine or tactics. If this will not provide the most cost-effective solution over the system's life cycle, the use or modification of systems or equipment that the component already owns is generally more cost effective than acquiring new materiel. If existing U.S. military systems or other on-hand materiel cannot be economically used or modified to meet the operational requirement, an acquisition program may be justified.

This chart provides the basic information needed to understand the Acquisition Life-Cycle Process. For additional information, please use the reference materials indicated above or contact the department point of contact (POC) associated with each section of the chart. Department POCs can detail further their respective section on the chart.

There is no single, approved taxonomy of the functional disciplines and sub-disciplines that, taken together, constitute defense systems acquisition. Acquisition career fields have been established under the auspices of DoDD 5000.52 for both military and civilian members of the Defense Acquisition Workforce.

II. ACQUISITION POLICY

DSMC POC: Acquisition Policy Department; FD-AP; (703) 805-5144

The Defense Systems Acquisition Management Process is structured by DoD Regulation 5000.2-R into discrete, logical phases separated by major decision points (collected milestones) to provide the basis for comprehensive management and progressive decision making. The number of phases and decision points shall be tailored to meet the specific needs of individual programs.

The documents applicable to a particular program at a specific milestone shall be determined individually for each program through the IPT process

and approved by the Milestone Decision Authority (MDA). Figures 1 and 2 contain a list of documents that may be applied.

Acquisition Strategy. A plan that serves as a roadmap for program execution from program initiation through post production support. ACAT I and IA Programs must contain information on: Open Systems Objectives, Sources, Risk Management, CAIV, Contract Approach, Management Approach, Environmental Considerations, Safety and Health Considerations, Modeling and Simulation, Source of Support, Warranties, and Government Property in possession of Contractors.

FIGURE 1. INFORMATION FOR MILESTONE REVIEWS - ACAT I AND ACAT IA PROGRAMS

Information Element (MDA may waive non-statutory requirements.)	Milestone				Reference	
	0	I	II	III	DoD 5000.2-R	Other
Acquisition Program Baseline (APB)	X	X	X	X	Part 3.2.2	10 USC 2435
Acquisition Strategy (11 elements)	X	X	X	X	Part 3.3	
Analysis of Alternatives (AOA)	X	X	X	X	Part 2.4	
Acquisition Decision Memorandum (ADM)	X	X	X	X	Part 5.2.1	
Affordability Assessment	X	X	X	X	Part 2.5.2	DoDD 5000.1
Beyond Low Rate Initial Production (LRIP) Report	X	X	X	X	Part 6.3.3	10 USC 2399
CAI Support Plan	X	X	X	X	Part 2.2.1	CJCSI 3170.01
Component Cost Analysis (CCA)	X	X	X	X	Part 5.6	DoDD 5000.4
Consideration of Technological Issues	X	X	X	X	Part 1.4	
Cost Analysis Requirements Description (CARD)	X	X	X	X	Part 3.5.1	DoDD 5000.4
Exit Criteria	X	X	X	X	Part 3.2.3	
Full Funding of DAB & MAISRC Programs	X	X	X	X	Part 2.5.1	
Independent Estimate of Life-Cycle Cost	X	X	X	X	Part 3.5.1	10 USC 2434
Interoperability Certification (C3I Systems)	X	X	X	X	DoDI 4630.8	
Live Fire Test & Evaluation Waiver Certification	X	X	X	X	Part 3.4.9	10 USC 2386
Live Fire Test & Evaluation (LFT&E) Report	X	X	X	X	Part 6.3.2	10 USC 2386
Legacy of Weapons Under International Law	X	X	X	X	X	DoDD 5000.1
Low Rate Initial Production (LRIP) Quantities	X	X	X	X	Part 1.4.4.1	10 USC 2400
Marginover Estimate	X	X	X	X	Part 3.5.2	10 USC 2434
Mission Need Statement (MNS)	X	X	X	X	Part 2.3	CJCSI 3170.01
Operational Requirements Document (ORD)	X	X	X	X	Part 2.3	CJCSI 3170.01
Oversighting (IPT) Leader's Report	X	X	X	X	Part 5.4.1	
OPI Staff Assessments	X	X	X	X	Part 5.4.1	
Program Office Estimate (POE) (life-cycle costs)	X	X	X	X	Part 3.5.1	DoDD 5000.4
Provisions for Evaluation of Post Deployment Support	X	X	X	X	Part 1.5.4	
Requirement for Program Under DoD Strategic Plan	X	X	X	X	Part 1.5	
System Threat Assessment	X	X	X	X	Part 2.2	10 USC 2399
Test & Evaluation Master Plan (TEMP)	X	X	X	X	Part 3.4.11	10 USC 2399
Test Results (DT&E, OT&E, LFT&E, etc.)	X	X	X	X	Part 6.3.1	10 USC 139

1 Including CAIV based objectives. 2 May be updated for MS II; unlikely to be required at Milestone III.

3 Normally not applicable to ACAT IA. 4 ACAT ID and ACAT IAM programs only.

FIGURE 2. INFORMATION FOR MILESTONE REVIEWS - ACAT II AND ACAT IAM PROGRAMS

Information Element (MDA may waive non-statutory requirements.)	Milestone				Reference	
	0	I	II	III	Primary	Other/Related
Acquisition Program Baseline (APB)	X	X	X	X	DoDD 5000.1, D.3.g	DoD 5000.2-R, 3.2.2
Acquisition Strategy	X	X	X	X	DoDD 5000.2-R, 3.3	
Affordability Assessment	X	X	X	X	DoDD 5000.1, D.1.a	DoD 5000.2-R, 2.5
CAI Support Plan	X	X	X	X	DoD 5000.2-R, 2.2.1	CJCSI 3170.01
Environmental Safety & Health (ESH) Assessment	X	X	X	X	DoD 5000.2-R, 3.3.7	42 USC 4321-47
Interoperability Certification (C3I Systems)	X	X	X	X	DoDI 4630.8	
Legacy of Weapons Under International Law	X	X	X	X	DoDD 5000.1, D.2	
Life-Cycle Cost Estimate	X	X	X	X	DoDD 5000.1, D.1.g	DoD 5000.2-R, 3.5.1
Live Fire Test & Evaluation Waiver Certification	X	X	X	X	DoD 5000.2-R, 3.4.9	10 USC 2386
Live Fire Test & Evaluation Report	X	X	X	X	DoD 5000.2-R, 6.3.2	10 USC 2386
Low Rate Initial Production (LRIP) Quantities	X	X	X	X	DoD 5000.2-R, 1.4.4.1	
Mission Need Statement (MNS)	X	X	X	X	CJCSI 3170.01	DoD 5000.2-R, 2.3
Operational Requirements Document (ORD)	X	X	X	X	DoDD 5000.1, D.1.d	
Risk Assessment	X	X	X	X	DoDD 5000.1, D.2.g	
Staff Assessments	X	X	X	X	DoD 5000.2-R, 3.4.1	10 USC 2399
Test & Evaluation Master Plan (TEMP)	X	X	X	X	DoD 5000.2-R, 6.3.1	10 USC 139
Test Results (DT&E/LFT&E)	X	X	X	X		

MDAs for ACAT II & IAM programs have wide latitude and broad authority over the content and format of many (but not all) of these information elements:

- Including CAIV as an Independent Variable (CAIV) based objectives.
- May be included in PMA's acquisition strategy.
- Normally not required for AIS programs.
- Programs subject to live fire T&E legislation.
- ACAT II only; however, it is DoD policy to limit LRIP quantities for all ACATs.
- Information on OSD T&E Oversight List.

* Army, Navy, and Marine Corps also have an ACAT IV category. The information on this chart may also be tailored for those programs.

Source (Figures 1 & 2): Defense Systems Management College Acquisition Policy Department

III. PROGRAM MANAGEMENT AND LEADERSHIP

DSMC POC: Program Management and Leadership Department; (FD-PML); (703) 805-4965

Fundamental change in the DoD acquisition culture is underway and requires individuals and organizations to change from a hierarchical decision-making process to one where decisions are made across organizational structures by multidisciplinary teams known as Integrated Product Teams (IPTs). Successful IPTs must be leaders who can create a vision for their program, translate this into concrete missions, break these down into critical success factors (goals), and nurture and develop (via empowerment and teamwork) the IPT's to successfully execute acquisition programs. Under DoDD 5000.1 and DoD Regulation 5000.2-R, the preferred management technique for use by a PM is known as Integrated Process and Product Development (IPPD). The goals of IPPD are to integrate all acquisition activities starting with requirements definition through production, fielding/deployment, and operational support in order to optimize the design, manufacturing, business, and supportability processes. IPPD is an expansion of concurrent engineering, and it simultaneously integrates all essential acquisition activities through the use of IPTs.

The primary program management activities are as follows:

- Planning:** The first program management planning activity is the development of the acquisition strategy, which lays out how the program will accomplish its objectives in terms of, among others, cost, schedule, performance, risk, and contracting activities. For Milestone decisions, it is included as part of a single document (to the maximum extent practicable). Each program's acquisition strategy is tailored to meet the specific requirements and circumstances of the program. Possible strategies include modifications of existing equipment, use of commercial/nondevelopmental item (NDI), technology demonstration and advanced prototyping, use of preplanned product improvements (PSI), and evolutionary development.

IV. EARNED VALUE MANAGEMENT

DSMC POC: Earned Value Management Department; (FD-EV); (703) 805-3769

Earned Value Management: The use of an integrated management system to coordinate work scope, schedule, and cost goals and objectively measure progress toward those goals.

Earned Value Management Systems (EVMS): Management standards (for significant dollar threshold contracts) used to evaluate an organization's integrated management systems.

Cost Performance Report (CPR): An objective summary of contract status that includes the following:

- Organizing & Staffing:** The establishment, organization, and staffing of the program office should be a direct outgrowth of the task analysis, which supports the program's acquisition strategy. As the program evolves, the program office organization and staffing should also evolve to support the changing task requirements and acquisition environment.
- Controlling:** The control system consists of standards against which progress can be measured; a feedback mechanism that provides information to a decision maker; and a means to make corrections either to the actions underway or to the standards. Examples of standards used in the systems acquisition process include the acquisition program baseline (APB), cost criteria, program schedule, program budget, specifications, plans, and test criteria. Examples of feedback mechanisms for program control, oversight, and risk management include Joint Requirements Oversight Council (JROC) and Defense Acquisition Board (DAB) reviews; selected acquisition reports (SAR) and Defense Acquisition Executive Summary (DAES) reports; the Integrated Baseline Review (IBR); the Earned Value Management (EVM) Reports; Contract Funds Status Report (CFSR) charts; the configuration management (CM) process; independent life-cycle cost (LCC) estimates; program and technical reviews; and developmental and operational test and evaluation (DOT&E).
- Leading:** Effective leadership is the key to program success. It involves developing an organization's mission, vision, and goals, and clearly articulating a set of core values. Dominant leadership roles in program management include strategy setting, consensus/team building, systems integration, and change management. For successful teams, factors such as empowerment, clear purpose, open communication, adequate resources, and a team-behavioral environment are critical.

Budgeted Cost of Work Scheduled (BCWS): Value of work scheduled in budget terms

Budgeted Cost of Work Performed (BCWP): Value of work completed in budget terms

Actual Cost of Work Performed (ACWP): Cost of work completed

Cost/Schedule Status Report (CSSR): A reasonably objective summary of contract status in terms of BCWS, BCWP, and ACWP.

Work Breakdown Structure: A product-oriented family tree composed of hardware, software, services, and data, which comprise the entire work effort under a program.

Integrated Baseline Review (IBR): A Joint Government/Contractor assessment of the performance measurement baseline (PMB).

V. CONTRACT MANAGEMENT

DSMC POC: Contract Management Department; (FD-CM); (703) 805-3442

Contract Management: The process of systematically planning, organizing, executing, and controlling the mutually binding legal relationship obligating the seller to furnish supplies and/or services and the buyer to pay for them.

Request: The document that defines the government/industry agreement.

A Draft RFP and Prequalification Conference: are used to ensure that the requirements are understood by industry and that feedback is provided to the government.

Cost Type Contract: A family of cost-reimbursement type contracts, where the government pays the cost (subject to specified limitations) and the contractor provides "best efforts." This type may provide for payment of a fee that may consist of an award fee, incentive fee, or fixed fee.

Engineering Change Proposal (ECP): A formal document used to make engineering changes to configuration management baselines in an existing contract.

Firm Fixed Price Contract: A family of fixed-price type contracts where the government pays a price, subject to specified provisions, and the contractor delivers a product or service. This type may provide for payment of incentives or other sharing arrangements.

RFP, SOW/SO, SPEC, CDRL (Request for Proposal, Statement of Work/Statement of Objectives, Specification, Contract Data Requirements List): The documents used in soliciting contractors for each phase of work. The RFP sets forth the needs, the SOW/SO is the formal statement of these needs as requirements for contractual effort (what the contractor will do), the specification sets forth the technical requirements (what the system will do), and the CDRL defines the data deliverables.

VI. FUNDS MANAGEMENT

DSMC POC: Funds Management Department; (FD-FM); (703) 805-3755

Government Budget Plan: The generic title for an internal government document that plans the long-range budgeting strategy for the life of a given program.

Planning, Programming and Budgeting System (PPBS): The PPBS is a time-driven resource allocation process within DoD to request funding for all operations, including weapon system development and acquisition. It is essential to convert each program's event-driven acquisition strategy and phasing into the PPBS's calendar-driven funding profiles to assure the appropriate amount and type of funds are available to execute the desired program.

Planning phase: The Defense Planning Guidance (DPG) sets forth broad policy objectives and military strategy. The DPG guides the development of the Program Objectives Memorandum (POM). **Programming phase:** The POM and the Program Decision Memorandum (PDM) are the key documents completed in this phase. The POM provides the services' strategies to meet the DoD objectives outlined in the DPG. The POM is reviewed by staff officers of the Secretary of Defense, the Commanders in Chief of unified and specified commands, and the Joint Chiefs of Staff. The reviews highlight major program issues and alternatives. The Deputy Secretary of Defense reviews the POM and the issues and decides on the appropriate course of action. The decisions are documented in the POM.

Budgeting phase: The completion of the Budget Estimate Submission (BES). The BES is the POM documentation updated for the decisions outlined in the PDM. The BES is reviewed by the OSD Comptroller and the Office of Management and Budget (OMB) for execution feasibility. Funding changes due to execution issues are identified in Program Budget Decisions (PBDs). The updated BES is forwarded to OMB and incorporated into the President's Budget. The President's Budget is due to Congress no later than the first Monday in February.

Enactment: The process that Congress uses to develop and pass the Authorization and Appropriation Bills. In the enactment process, the DoD has an opportunity to work with Congress and defend the President's budget.

Types of Funds:

- Basic Research:** includes all scientific study and experimentation efforts directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.
- Applied Research:** includes all military applicability studies and experimentation efforts directed toward nonspecific weapon systems.
- Advanced Technology Development:** includes all efforts directed toward projects that have moved into the development of hardware for test. The prime result for these efforts is proof of design concept.
- Demonstration and Validation:** includes all efforts of projects in the PDAR acquisition phase.
- Engineering Manufacturing Development (EMD):** includes all development efforts in the EMD acquisition phase.
- Management and Support:** includes support of organizations, people, and facilities required for general research and development activities not funded under the Working Capital Funds concept. Test ranges, maintenance and support of laboratories, operations and maintenance of test aircraft and ships, and study and analysis in support of Research and Development programs funded by operations and maintenance are included.

Cost Estimating: A realistic appraisal of the level of cost most likely to be realized. The most estimation methods are analogy, parametric, engineering, and extrapolation from actuals.

Life-Cycle Cost (LCC): The total cost to the government of acquisition and ownership of the system over its full life. It includes the cost of development, acquisition, support, and (where applicable) disposal. The USD(AR) has defined Defense Systems Total Ownership Cost (TOC) as Life-Cycle Cost.



DEFENSE SYSTEMS ACQUISITION MANAGEMENT PROCESS

[illegible]

CIPLINES (SUGGESTED BY DoD 5000.52) EXPECTED TO BE REPRESENTED ON VARIOUS IPTs

VII. SYSTEMS ENGINEERING (SE)

DSMC POC: Systems Engineering Department; (FD-SE); (703) 805-5258

The function that controls the total system development effort for the purpose of achieving an optimum balance of all system elements is SE. The SE process is designed to translate operational needs and/or requirements into a system solution that includes the design, manufacturing, T&E, and support processes and products. SE establishes a proper balance among performance, risk, cost, and schedule, employing a top-down iterative process of requirements analysis, functional analysis and allocation, design synthesis and verification, and system analysis and control.

A. Configuration Management (CM) Baselines -

- 1.) **Functional Baseline** - The technical portion of the program requirements (system performance specification) that provides the basis for contracting and controlling the system design.
- 2.) **Allocated Baseline** - Defines the performance requirements for each configuration item of the system (item performance specifications). It is normally established at PDR (preferably by the contractor).
- 3.) **Product Baseline** - Established by the detailed design documentation for each configuration item (item detail specifications) and includes the process baseline and material baseline.

B. Replanned Product Improvement (RPI) - A deliberate decision delaying incorporation of a system capability but providing growth allocations for the capability.

C. Technical Management Plan (TMP) - The TMP defines the contractor's plan for the conduct and management of the fully integrated effort necessary to satisfy the general and detailed requirements as implemented by the Request for Proposal (RFP) or contract schedule, statement of work/ objectives, and specifications. (Best Practices)

D. Design Reviews and Audits

- 1.) **ASR - Alternative Systems Review** - A formal review conducted to demonstrate the preferred system concept(s).
- 2.) **SRR - System Requirements Review** - A formal, system-level review conducted to ensure that system requirements have been completely and properly identified and that there is a mutual understanding between the government and contractor.
- 3.) **SFR - System Functional Review** - A formal review of the conceptual design of the system to establish its capability to satisfy requirements. It establishes the functional baseline.

- 4.) **SSR - Software Specification Review** - A formal review of requirements and interface specifications for computer software configuration items.
- 5.) **PDR - Preliminary Design Review** - A formal review which confirms that the preliminary design logically follows the SRR findings and meets the requirements. It normally results in approval to begin detail design.
- 6.) **CDR - Critical Design Review** - A formal review conducted to evaluate the completeness of the design and its interfaces.
- 7.) **TRR - Test Readiness Review** - A formal review of the contractors' readiness to begin testing computer software configuration items.
- 8.) **PCA - Functional Configuration Audit** - A formal review conducted to verify that all subsystems can perform all of their required design functions in accordance with their functional and allocated configuration baselines.
- 9.) **SVR - System Verification Review** - A formal review conducted to verify that the actual item (which represents the production configuration) complies with the performance specification.
- 10.) **PCA - Physical Configuration Audit** - A formal review that establishes the product baseline as reflected in an early production configuration item.

E. System/Product Definition - This is the natural result of the threat/opportunity-driven Requirements Generation System and the common thread (or area of common interest) among all acquisition disciplines.

- 1.) **Mission Need Statement (MNS)** - A formal document, expressed in broad operational terms and prepared in accordance with GCS 13170.01, that documents deficiencies in current capabilities and opportunities to provide new capabilities.
- 2.) **Program Definition** - The process of translating broadly stated mission needs into a set of operational requirements from which specific performance specifications are derived.
- 3.) **Operational Requirements Document (ORD)** - A formatted statement, which is prepared by the user or user's representative, containing operational performance parameters for the proposed concept/system that defines the system capabilities needed to satisfy the mission need. It is prepared at each milestone, usually beginning with Milestone I.
- 4.) **System Threat Assessment & Projections** - Prepared by a collaboration among the intelligence, requirements generation, and acquisition management communities to support program initiation (usually Milestone I). It is maintained in a current and approved or validated status throughout the acquisition process.

VIII. SOFTWARE ACQUISITION MANAGEMENT

DSMC POC: Software Management Department; (FD-SM); (703) 805-3788

Major, modern DoD systems are almost always software-intensive, in which software is the largest segment in any system development cost, system development risk, system functionality, or development time criteria. DoD 5000.1 and DoD 5000.2-R combine and integrate policy requirements and management guidance for weapons systems software, C3I systems, and Automated Information Systems (AIS).

An AIS is a combination of computer hardware and software, data, or telecommunications that performs functions such as collecting, processing, transmitting, and displaying information.

Pre-Phase 0: Determining Mission Needs: DoD 5000.2-R requires confirmation that requirements defined in DoD 8000.1 (Defense Information Management Program) have been met for ACAT IA programs.

Phase 0: CR: Broad system concepts are defined. Depending on the type of software-intensive system being developed, other key Phase 0 activities typically could include:

- Assessing Information Operations risks IAW DoD 3600.1.
- Assessing information assurance requirements.
- Addressing compatibility, interoperability, and integration goals for Command, Control, Communications, Computer, and Intelligence (C4I) Systems IAW DoD 4630.5, DoDI 4630.8 & CJCS 6212.01A. Note that all systems that interface with C4I systems also require a C4I Support Plan.
- Planning for software maintenance (Post Deployment Software Support, (PDSS)). This planning is normally accomplished by a Computer Resources IPT (CR-IPT), which may prepare a Computer Resources Life Cycle Management Plan (CRLCMP) or its equivalent.
- Refinement of ORD requirements related to software (support and integration requirements).

Phase I: PDRR: Initial software requirements are refined. Other key Phase I activities typically could include:

- Development and refinement of an Operational Concept Document (OCD), a System/Subsystem Specification (SSS), and Software Requirements Specifications (SRS).
- Establishment of the basis for the system's Software Architecture.
- Selection and tailoring of an appropriate software development standard and acquisition strategy.
- Initial identification of Software Items (SIs).

Phase II: EMD: EMD translates the most promising design into a mature, producible design. Depending on the type of software-intensive system being developed, key Phase II activities typically could include:

- Refinement of the system's Software Architecture. Mandatory guidance is included in the Joint Technical Architecture (JTA).
- Generation of a Software Development Plan (SDP) by a developer.
- Use of mandatory DoD standard data elements (DoDD 8320.1).
- A widely-used "Best Practice" in assessing the maturity of a developer's process is the Software Capability Evaluation (SCE), an on-site assessment of software process maturity.
- Decision on use of an appropriate programming language.
- Risk-based software metrics, based on service policies and OSD's Practical Software Measurement (PSM) initiative and refined from previous life cycle phases, are used to gain visibility into EMD software development activities.
- Key developer-produced outputs of the Software Development Process can include a Software Transition Plan (STP), used to transition the software to a support environment and a Software Installation Plan (SIP), used to assist in Phase III fielding activities.
- A Software Product Specification (SPS), produced by the developer, is normally used to establish the software product baseline.

Phase III: Production, Fielding/Deployment & Operational Support: Post Deployment Software Support (PDSS) activities, by far the largest cost component of the software life cycle, are initiated for the operational support requirement of this phase IAW with the chosen software support concept.

Follow-On OT&E (FOT&E): FOT&E needed during and after the production phase to refine estimates from the IOT&E, to evaluate system changes, and to reevaluate the system as it continues to mature in the field. FOT&E may evaluate system performance against new threats or in new environments.

Full-Up Live Fire T&E (LFT&E): A system-level live fire test of an ACAT I or II covered system, major munitions, or missile program, or a product improvement to one of these systems configured for use in combat. Required before going BLRIP.

Initial Operational T&E (IOT&E): All OT&E conducted on production or production representative articles to support the decision to proceed BLRIP. It is conducted to provide a valid estimate of expected system operational effectiveness and suitability for ACAT I and II systems.

Lethality T&E: Testing the ability of a munition to cause damage that will cause the loss or a degradation in the ability of a target system to complete its designated missions.

LFTE Report: Completed by the DOT&E for ACAT I and II systems that have been subjected to a full-up live fire test prior to MS III. Usually included in the DOT&E report of the IOT&E (BLRIP report) when sent to Congress.

Modification T&E: Testing done after Milestone III to evaluate modifications/upgrades/improvements to the system.

IX. TEST AND EVALUATION (T&E)

DSMC POC: Test and Evaluation Department; (FD-TE); (703) 805-5290

T&E is a process by which a system or components are compared against requirements and specifications through testing. The results are evaluated to assess progress of design, performance, supportability, and the like.

Beyond Low Rate Initial Production (BLRIP) Report: Completed by the Director, Operational Test and Evaluation (DOT&E) to assess the Initial Operational Test and Evaluation (IOT&E) for a developing system for the Milestone III decision. A copy is provided to Congress.

Combined Developmental and Operational Testing (DT/OT): Combining DT and OT is encouraged to achieve time and cost savings. The combined approach shall not compromise either DT or OT objectives. A final independent phase of IOT&E shall still be required for ACAT I and II programs for BLRIP decisions.

Developmental Test and Evaluation (DT&E): A technical test conducted to provide data on the achievability of critical system performance parameters. This testing is performed on components, subsystems, and system-level configurations of hardware and software.

DT&E Report: The developing agency shall prepare a DT&E Report and formally certify that the system is ready for the next dedicated phase of OT&E.

TEST AND EVALUATION (T&E) CONTINUED

Operational Assessment: An evaluation of operational effectiveness and suitability made by an independent operational test agency, with user support as required, on other than production systems.

Operational T&E (OT&E): The field test, under realistic combat conditions, of any item (or key component of), weapons, equipment, or munitions for the purpose of determining the effectiveness and suitability for use in combat by typical military users, and the evaluation of the results of such test. Required for ACAT I and II programs.

Production Acceptance T&E (PAT&E): T&E of production items to demonstrate that items produced fulfill requirements and specifications of the procuring contract or agreements.

Production Qualification T&E: A technical test conducted to ensure the effectiveness of the manufacturing process, equipment, and procedures. These tests are conducted on a number of samples taken at random.

from the first production lot and are repeated if the design or process is changed significantly.

Qualification Testing: Testing that verifies the contractor's design and manufacturing process and provides a performance parameter baseline for subsequent tests. (Best Practice)

Survivability T&E: Testing the capability of a system and crew to avoid or withstand a manmade hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

Test and Evaluation Master Plan (TEMP): The testing strategy in the TEMP for ACAT I and IA programs shall focus on the overall structure, major elements, and objectives of the test and evaluation program that is consistent with the acquisition strategy.

Vulnerability T&E: Testing a system or component to determine if it suffers definite degradation as a result of having been subjected to a certain level of effects in an unnatural hostile environment. A subset of survivability.

X. MANUFACTURING AND PRODUCTION

DSMC POC: Manufacturing Management Department; (FD-MM); (703) 805-3763

Manufacturing (also referred to as **Production**) is the conversion of raw materials into products and/or components through a series of manufacturing procedures and processes. Manufacturing Management is the technique of planning, organizing, directing, controlling, and integrating the use of people, money, materials, equipment, and facilities to accomplish the manufacturing task economically.

Assess and Resolve Production Risk: Identify and demonstrate required advances beyond the current capability.

Assess Production Risks: Estimate probabilities of success or failure in manufacturing.

Complete Manufacturing Technology Development: Manufacturing technology is developed through a phased approach from definition to demonstration. This represents the final demonstration of the integrated manufacturing scheme.

Establish Design to Goals: Establish design parameters for the system.

Estimate Manufacturing Costs: Develop resource estimates for manufacturing of various system alternatives.

Evaluate Manufacturing Technology (MANTECH) Needs: Discriminate manufacturing capabilities versus requirements to define new facilities and equipment needs.

Evaluate Production Feasibility: Assess the likelihood that a system design concept can be produced using existing manufacturing technology.

Final Manufacturing Plan: The refined and formalized initial manufacturing plan. This plan is not required to support milestone decisions and shall not be used as milestone documentation or as periodic reports.

Industrial Capability Assessment (ICA): A legal requirement (10 USC 2440) at each milestone to analyze the industrial capability to design, develop, produce, support, and (if appropriate) restart the program.

Influence the Design Process (Through Productivity Engineering and Planning): Application of design and analysis techniques to reduce the potential manufacturing burden.

LRIP: Low rate of output used to prove manufacturing technology and facilities at the beginning of production.

Preliminary Manufacturing Plan: The description of a method for employing the facilities, tooling, and personnel resources to produce the design. The Manufacturing Plan belongs to the PM and is used to manage program execution throughout the life cycle of the program. This plan is not required in support of milestone decisions and shall not be used as milestone documentation or as periodic reports.

Productivity Assessments: Assessments of the productivity aspects of proposed design alternatives/approaches.

Phased Productivity Assessments: Discretionary assessments of a program to determine if the design of the product and the manufacturing process are ready for the production phase. These should be conducted in conjunction with other design reviews.

Production Strategy: The approach to obtaining the total quantity of a system at some rate for some cost.

Second Source/Breakout Decisions: Execution of acquisition strategy to establish two producers for the part or system and/or strategy to convert some parts or systems from contractor furnished to government furnished.

Spare Parts Production: Arrange for purchase of spare parts or a portion of normal production runs.

Value engineering (VE): A program to allow for the sharing of cost savings derived from improvements in the manufacturing processes.

XI. ACQUISITION LOGISTICS

DSMC POC: Logistics Management Department; (FD-LM); (703) 805-2497

Acquisition Logistics is a multifunctional technical and management discipline associated with the design, development, test, production, fielding, sustainment, and improvement/modification of cost-effective systems that achieve the user's peacetime and wartime readiness and sustainability requirements. The principal goals/objectives of acquisition logistics are:

- To influence system design
- To concurrently field the system and its necessary support infrastructure, and
- To improve the system and its support.

Support Elements, such as the following, have traditionally been included under Acquisition Logistics:

- 1.) Maintenance Planning
- 2.) Manpower and Personnel
- 3.) Supply Support
- 4.) Support Equipment
- 5.) Technical Data
- 6.) Training and Training Support
- 7.) Computer Resources Support
- 8.) Facilities
- 9.) Packaging, Handling, Storage and Transportation
- 10.) System/Design Interface

Support Plan (SP) (also known as Integrated Logistics Support Plan (ILSP) or Acquisition Logistics Support Plan (ALSP)) - Best Practice in logistics generally involves preparing and maintaining a formal or informal document for support of the fielded system. The SP belongs to the PM and is used to manage program execution throughout the life cycle of the program. This plan is not required in support of milestone decisions and shall not be used as milestone documentation or as periodic reports. It may be prepared as a stand-alone document or as an annex to other documents such as the TMP.

Deployment Plan - The plan to provide for a smooth introduction of the system/equipment to the user. This plan is not required in support of milestone decisions and shall not be used as milestone documentation or as periodic reports. This plan may be prepared as a "stand-alone" document or an annex to the Support Plan.

Post Production Support Plan (PPSP) - A plan to ensure continued systems management and support activities to ensure continued attainment of system readiness objectives with economical logistic support after cessation of production of the end-item (system or equipment). This plan is not required in support of milestone decisions and shall not be used as milestone documentation or as periodic reports. This plan may be prepared as a "stand-alone" document or an annex to the Support Plan.

Supportability Analysis - An analytical tool, conducted as part of the SE process, to determine how to most cost effectively support the system over its entire life cycle and form the basis for related design requirements included in the specifications. See MIL-HDBK-502 and MIL-PRF-49506.

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Review

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HRXXI Contract Speeds Up Human Resources Procurement

SGT. 1ST CLASS CONNIE E. DICKEY

WASHINGTON (Army News Service, Nov. 17, 1999) — After more than six years of working to provide a supplement to in-house human resource capabilities, the Army recently announced a new contract.

"The Human Resource XXI Century Contract is a tool that an agency can use to meet its human resources needs," said Susan Harvey, director of the HRXXI Business Unit, within the Office of the Secretary of the Army (Manpower and Reserve Affairs).

This contract can provide such human resource services as personnel records maintenance; transition processing; recruiting and training; employee counseling; distance learning; replacement processing; core competency HR studies and analyses; personnel services; automation support; and recruiting management analysis and support.

Harvey said that anyone who has a concept of what they need can call the HRXXI office, and one of the staff members will start the process of developing the statement of work. The office will also monitor the contract through the delivery of services. The staff can also help in any modifications that may be needed to the contract.

"One of the beauties of this contract is that it is very flexible and many avenues are open to provide the needs of an organization," Harvey said. "Even though there are only two prime

contractors, each contractor has many sub-contractors under them," she said.

Harvey explained the Army's leadership developed the idea of providing help to federal managers and commanders because of the Army's changing needs in human resources. She said the Army decided "to go slow, to go fast" in developing a contract vehicle that the Army would need for the 21st century. "We are at the 'go fast' stage now," Harvey said.

The initiative began in the early 1990s almost exclusively to provide congressionally mandated transition and employment assistance to separating servicemembers, their families, and federal employees. The resulting Transition Assistance Office and the Job Assistance Center worked under the direction of the U.S. Army Personnel Command.

Harvey said that the Army leadership supported an effort to ensure the new contract provided what managers needed. "The long-term procurement planning took six years and produced the one-of-a-kind highly competitive contract," she said.

"This contract is open to all government and civilian agencies and especially for the Army — from headquarters, to major commands, installations, and unit levels," Harvey said. "The Army has done the procurement work, and the contract is now open to [whomever] is seeking help," Harvey said.

As time passed, other agencies began to use this PERSCOM-provided service because it had a reputation for being fast, easy, and cost-effective, she said. Several of the agencies that used this earlier contract, and currently use HRXXI, include PERSCOM; U.S. Army Europe; Eighth U.S. Army in Korea; the National Guard Bureau; the U.S. Army Reserve; the Department of Defense; the Department of Agriculture; the National Aeronautics and Space Administration; and the General Services Administration. Another attraction of the HRXXI contract is the 2 percent fee it costs, making the HRXXI Business Unit office self-sustaining. "It is considerably lower than other programs. Fees usually range somewhere between 5 and 18 percent," Harvey said. Fees include assistance with development of the statement of work, cost estimate preparation, proposal evaluation, and contractor selection.

Joan Peterson, Personnel Division director for NASA, said the contract proved to be "perfect and very effective for our agency." She said NASA began a 50-percent reduction in 1995 and looked to the Army for help. "Since the Army had considerable experience in downsizing, we went to them and they were extremely helpful in helping us set up offices in all of our 10 sites."

NASA needed job assistance and job transition help. Peterson said by using the contract, NASA was able to provide workshops, seminars on interviewing and negotiating benefits, as well as providing individual counseling.

"We needed a great deal of flexibility because each site had different needs, and with the contract we were able to tailor our needs for each site," she said.

"In 60 days or less an office can have contractor personnel fulfilling work requirements, although some are even quicker," Harvey said.

HRXXI is able to help anyone, anywhere, Harvey said. "There is no 'too small' requirement nor 'too large' requirement. And, remote sites are not at a disadvantage. We have contractors on the DMZ in Korea, we are in Europe, throughout the United States, on aircraft carriers, and we've gone to Bosnia and to Haiti.

"This is a way for managers to keep up with their ever-changing missions and another resource they can use to make their jobs easier, because they really are trying to do more with less," Harvey said.

For more information, call the office at 703-602-2773 (DSN 322-2773), E-mail them at hrxxi@hqda.army.mil, or check their Web site (under construction) at <http://www.hrxxi.army.mil>.

Editor's Note: Dickey is on the staff of ArmyLINK News. This information is in the public domain at <http://www.dtic.mil/armylink/news>.

Ethics: A Pencil Case

"Maybe Americans Can Learn to Be What We Believe Them to Be"

DR. JAY W. GOULD III

This article first appeared in the *Journal of Management History*, Vol. 5, No. 8, 1999, pp. 506-515, as part of a special symposium issue on an operational code approach to W. Edwards Deming: the man, the context, the servant, and the legacy. Reprinted by permission of the MCB University Press, Bradford, United Kingdom.

A foreign national, naturalized as an American citizen, recently graduated *summa cum laude* with a degree in computer science with an emphasis on statistics. She applied for a federal position and was accepted as an exceptional scholar in a very prestigious organization. The position was one that required drug testing, a background investigation, personal interviews, and lie detector tests. Having never been exposed to security requirements, she was amazed by, but understood, the necessity for all the rules. Her co-workers readily accepted her. They offered suggestions describing the social norms and methods of operation of the institution.

An Outsider's Vision

One person suggested to her: "Now, when they give you the lie detector test they will ask you if you have ever taken a pencil home from work. Of course, you must answer yes." To this, she responded:

"I do not understand. Why must I say 'yes?'" Her mentor, looking somewhat aghast, said: "Well of course, you have to say 'yes.' Everyone does." Rather than pursue a concept she did not understand, she returned home to relate the story to her husband. His initial reaction was to laugh, for he understood her quandary. His wife was an eth-

ical person, and would not take a pencil from the office. Her husband responded saying: "Look, you do not have to say 'yes.' For you, it is a lie. Just tell the truth and never respond to any question with an answer someone has told you to give — just tell the truth."



Gould is a professor of Systems Engineering Management, Test and Evaluation Department, Faculty Division, Defense Systems Management College (DSMC), Fort Belvoir, Va. Born and reared in his grandfather's circus, Gould left the circus to enter the United States Military Academy. While there he learned of Deming's work at Aberdeen Proving Ground, but their paths did not cross till some years later. Gould's career spans the development of DoD's large missile systems to the commercial development and patenting of new products. As a managerial development author, consultant, and lecturer, he specializes in facilitating start-up integrated product teams. He is a DoD Certified Acquisition Professional in four major career fields: program management, test and evaluation, systems engineering and manufacturing management. In addition to teaching at DSMC, Gould lectures at Troy State University, Strayer College, and the International Test and Evaluation Association.

The next day, her husband, who was also employed by the Federal Government, told the story to a fellow worker who had spent some time in an agency similar to the one in which his wife was employed. The fellow worker's response to the husband went along these lines: "You gave her the wrong answer. The part about always telling the truth is right. What is wrong is the aspect of the pencil. Have her go to work and take a pencil so she can say 'yes.' Everyone does."



To achieve harmony,
all elements of the
system must work in
concert with one
another to achieve
the orchestration of
a "finely tuned
corporate
structure." Deming
firmly believed
that an orchestra
was the ultimate
harmonious
system.

country U.S. firm, and although she did not know it at the time, the ethical principles she espoused were a part of Deming's "14 points and management philosophy."

When her husband returned that evening, he informed his wife of this conversation. On hearing that she should go to work and take a pencil, her indignant response was: "I would rather purchase pencils and take them into the office than do that. Why should I just say yes? At times, I just do not understand you Americans." Her response was triggered by her personal ethical values. To her, ethics are not situational. She had earlier adopted a belief that she had learned: "To be an American means a person does not even take a pencil from the office." The young woman adopted her training in an in-

Ethics in Business

This young woman had been introduced to American culture in a U.S.-owned production facility in Southeast Asia. She and her co-workers were indoctrinated there in the methods and thoughts of Americans. They learned the theory of Deming's "14 points." Since Asians cater to the cult of the individual, this U.S. company did not explain to them who Deming, was, or even quote him, but rather defined the company's interpretation of Deming's 14 points as the rules of how the firm would operate. It was a

quid pro quo — here is our promise and here is what we expect from you. The requirements were established at the outset. What the woman and every production worker came to understand was that the company's requirements worked fine. By following the company's requisites of social interaction, while engaged in the fabrication of electronic products, the teams and the individual members made more money than they had ever made in their lives. The workers firmly believed that they were emulating U.S. production workers, who they sincerely believed produced the highest quality products in the world. At lunch, the woman and her colleagues would discuss how U.S. workers made their production floor decisions with the good of the company and eventual customer in mind. During lunch they would discuss how they could make their products better, cheaper, faster, and at lower overall cost. Their vision was for them to be like Americans and to produce the finest products in the world. Their quest was to achieve what they believed to be the United States' many virtues:

- Just
- Fair
- Honest
- Hardworking
- Caring
- Trustworthy
- Respectful of One Another
- Freedom of Speech
- Freedom of Religion
- Racially Integrated

Graphic Gestalt

The U.S. employer's acculturation that socialized and conditioned her partly was based on what Third World persons experienced in U.S. movies, a vision that came not only from the dialog or movie plot but also from the graphic *Gestalt*. The clothes that people wore, the food on the table, the hours and days of work, and all else portrayed in the movie scene were all contributors. As outsiders looking in, they were awed at what Americans believed to be commonplace and ordinary. Their vision of the U.S. worker was anything but common and ordinary. Their perceptions were based upon limited experiences with "Made in USA"

products, and an indoctrinated belief in product quality and service to the customer. These are also the ethical principles emanating from Deming's "14 points and profound knowledge." The woman's stated view after years of integrating herself into the fabric of U.S. society is:

What I believed about America before I came here was wonderment. After being here for a number of years what I see is an unfulfilled vision. I cannot tell my former company teammates the truth. First of all, they would never believe me. Second, I could not destroy their beautiful but distorted image of this wonderful country of ours. To do so would take something from them I have no right to take. My former country seems to have higher standards of ethical values as they relate to religious and racial integration, stealing even a pencil from the company, and producing products of quality. Maybe Americans can learn to be what we believe them to be.

Deming's 14 points and profound knowledge are the benchmarks of the outsider's view of the United States. Where people of other nations experience synergistic ethical value in Deming's philosophy, we take it for granted and to a certain extent view it cynically.

Laurence J. Quick, associate professor of economics and business at Benedictine College, in an unpublished paper, cites a literature search he conducted covering academic business journals published during the period 1989-1993. He stated: "In the approximately 150 publications identified with Deming in their titles, not one publication addresses the ethical content of the Deming management method." Quick posits: "The Deming, management method would not be effective in the absence of a highly ethical corporate culture." Referencing Deming's 14 points, Quick goes on to say: "Explicit or implicit in the Deming management philosophy are the following ethical principles:

- Drive out fear/build trust (points 1, 4, 8, 11, 12).
- End adversarial relationships/promote cooperation (points 9, 10, 11).

Deming's 14 points and profound knowledge are the benchmarks of the outsider's view of the United States. Where people of other nations experience synergistic ethical value in Deming's philosophy, we take it for granted and to a certain extent view it cynically.

- Stop shame/respect human dignity (points 10, 11, 12, 13, 14).
- End greed/promote equity (point 1)" (Quick, not dated, or published).

Moral Philosophy

Quick echoes the view of this woman and her former fellow factory workers in Southeast Asia. They created for their U.S. employer a corporate culture based on Deming's ethical principles by trying to be like the Americans they envisioned. Ethical values must underlie the principles and standards that guide individual, corporate, and governmental behavior. As such, Deming's 14 points would be better described as a "moral philosophy." James Rest describes moral philosophy as presenting guidelines for, "determining how conflicts in human interests are to be settled and for optimizing mutual benefit of people living together in groups" (Rest; 1986, p. 1). Robbins, Ferrell, and Fredrich, among others, cite ethical decision criteria as the basis for making ethical choices. According to Robbins, the tension between deontology¹ and teleology² has been nominally interpreted by U.S. business to favor the teleological or utilitarian viewpoint: i.e., "It is in the best interests of the stockholders" (Robbing, 1994, p. 84). This short-term thinking is in sharp contrast with Deming's position: "The customer is the most important part of the production line. Quality should be aimed at the needs of the customer present and future" Deming, 1982, p. 5). Deming, like his mentor Walter Shewart, believes that the long-term good of the customer vs. the good of the short-term profit of the corporation evolves around the design of a product that gives satisfaction at a price the customer can pay.

Although this view on the surface seems to be very deontological, according to the Deming theory of corporate economic growth it is really prescriptive utilitarian. Deming, and those proteges closest to him such as Orsini, Killian, Scherkenbach, Mann, Walton, Joiner, and Scholtes, all cite the chain reaction written by Deming (left) on the blackboard in every meeting he held with

DEMING CHAIN REACTION

- > Improve quality
- > Decrease costs
- > Productivity improves
- > Better quality and lower price capture the market
- > Stay in business
- > Provide jobs and more jobs.

(Deming, 1982, p. 3).

Japanese management from 1950 onward.

Theological theory defines utilitarianism as being: "The right or acceptable actions as those that maximize total, or the greatest good for the greatest number of people" (Ferrell and Fraedrich, 1994, p. 54). The U.S. company promised its Southeast Asian employees that if they would abide by the established ground rules, which contained the implicit requirement to strive toward the vision of "being American," they would make more money than they had ever made before in their lives. The agreement was an ethical contract teleologically framed. The "pyramid of corporate responsibility" based on the *economics* (being profitable), and proceeding upward to *legal* (obeying the law), and further up to *ethical* (obligated to do what is right, just and fair), and finally to *philanthropic* (improvement of the community's quality of life) cannot be built without applying Deming's moral charge in "14 points and his theory of corporate economic growth" (Carrol, 1991, p. 42).

Kohlberg's Phase 3

The corporate culture established a set of values, beliefs, goals, norms, and rituals that all the members of the woman's group shared. "Culture gives the members of the organization meaning and provides them with rules of behaving within the organization" (Ferrell and Fraedrich, 1994, p. 113). The rules established by the U.S. company were Deming's 14 points. It can be argued that what the U.S. company did was to create a learning environment wherein the opportunity and experiential setting allowed significant advances in the worker's ethical thinking. It has been argued that ethics cannot be taught because the socialization of the child defines the boundaries of ethical development.

In a Department of Defense training video, James A. Donahue and Martin L. Cook present the rationale behind Lawrence Kohlberg's "ethical development scale." It is their view that a lack of experience and opportunity holds most Americans in either Kohlberg Phase

1, pre-conventional (self reward) or Phase 2, conventional (obedience to authority, law and order). The utilization of Deming's management philosophy provided the construct for the educational curriculum implemented by the U.S. firm. By this experiential technique they were able to inculcate the workers into Phase 3, post-conventional (social contract of

fairness and equity) with both extrinsic and intrinsic motivational factors. The post-conventional phase emphasis on the social contract, equity, and fairness approaches a deontology requirement to preserve individual rights and the honorable intentions of behavior.

Deming's 14 Points

Ferrell and Fraedrich posit: "Ethical responsibilities are defined as behaviors or activities that are expected of business by society but are not codified by law" (Ferrell and Fraedrich, 1994, p. 81). To the workers in that Southeast Asian electronics plant, what was expected of them and what the U.S. company promised in return was not codified. Quality was mutually defined and implemented, not just as evidence of success, but as a requisite for survival. The quality ethos of Deming's philosophy was endemic in every action to produce a product. The 14 points on the left along with Deming's theory of profound knowledge are the baseline of what could be termed the Deming ethics model for the 21st century. This value set is further illustrated by his opening quotation in *Out of The Crisis*: "Who is that dark-eneth counsel by words without knowledge." His heartfelt tome was a wake-up call to a U.S. industrial complex that had tossed his theories aside in the wake of the World War II industrial boom. In those times anything that could be made was sold and exported. The United States was the only viable producer in the world. The domination was so complete that the United States became arrogant, slipshod in its work ethic, and compromised in production quality.

Deming knew the power of his doctrine being implemented in Japan and in the Five Tigers of Southeast Asia (Malaysia, Singapore, Hong Kong, Indonesia, and Thailand). He foresaw the U.S. downfall in the automotive market and like John the Baptist was sounding the clarion call. It was his firm belief no one should attempt to counsel others without a firm and structured foundation. He called this foundation, *profound knowledge*. He pressed hard to clarify his theory in his final book, *The New Economics*, before the ravages of prostate cancer overcame

DEMING'S 14 POINTS

1. Create constancy of purpose for the improvement of products and services.

2. Adopt a new philosophy.

3. Cease dependence on inspection to achieve quality.

4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier.

5. Improve constantly and forever every process for planning, production, and service.

6. Institute training on the job.

7. Adopt and institute leadership.

8. Drive out fear.

9. Break down barriers between staff areas.

10. Eliminate slogans, exhortations, and targets for the workforce.

11. Eliminate numerical quotas for the workforce and numerical goals for management.

12. Remove barriers that rob people of pride of workmanship. Eliminate annual rating or merit systems.

13. Institute a vigorous program of education and self-improvement for everyone.

14. Put everyone in the company to work to accomplish the transformation (Deming, 1982, dust-jacket).

him. Deming's system of profound knowledge is based upon four ethical principles: appreciation for a system, knowledge about variation, theory of knowledge, and psychology. Deming, firmly believed that a person or a corporation could not adequately implement his 14 points unless they understood and possessed profound knowledge.

Appreciation For a System

Appreciation for a system starts out with the understanding of what a system is: "A network of interdependent components that work together to try to accomplish the aim of the system" (Deming, 1993, p. 50). The anchor for this statement is of course point 1 of the 14, constancy of purpose. It is management's ethical responsibility to know and understand all of the interrelations of all of the components of the system and the people who work within it. Following a teleological approach, Deming firmly believed that members of a system had an obligation even to the point of suboptimization to achieve a greater good for the whole of the corporation. Looking at this from another aspect, he would lecture that when a department or division made itself look good at the expense of another department, the offending department was causing the whole company to be suboptimized. To achieve harmony, all elements of the system must work in concert with one another to achieve the orchestration of a "finely tuned corporate structure." Deming firmly believed that an orchestra was the ultimate harmonious system.

Knowledge of Variation

In its simplest terms variation is the very nature of life. All things of a species are similar but all possess a uniqueness possessed by none other. The degree by which two leaves are exactly like one another can be measured just as two machine parts produced on the same computer-controlled lathe can be measured. Minor variations (nothing to worry about) are significantly different from major variations (reason for immediate action). Deming called these common cause and special cause respectively (Deming, 1993 p. 210). Deming charged

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management with two ethical responsibilities: the first is the setting of the metric defining the limits that would separate common cause from special cause. The second is knowledge of the system, which would prohibit management from making a mistake of not knowing the difference between the two. If every little bump in the road caused a panic, calamity would reign and chaos would rule the corporation.

Theory of Knowledge

As each of the 14 points are interrelated, so too are the locutions of profound knowledge. According to Deming, all knowledge is built on theory. Theories convey predictions of the future. Rational predictions require observations and theory to systematically test the outcomes. Systematic revision and extension of theory based on comparisons of prediction and observation defines what should be revised (Deming, 1993, p. 119). Deming studied the use of statistics in theory development with Sir Ronald Fisher and Walter A. Shewart. You may ask: "What does this have to do with ethics?" The easy response is: "Do no wrong." Without theory, neither wrong nor right can be defined. The theory of knowledge is then interlocked

with the theory of variation and psychology.

Point 6 is "institute training on the job." If this training consists of worker training worker in sequential series, management has violated their ethical responsibility. The processes by which things are done are owned by management. Management has the ethical responsibility of knowing the system and all of its components. First-line supervision's ethical responsibility is not oversight, but rather it is coaching, training, and indoctrinating the new employee into the corporate culture. The American corporate success in Southeast Asia was based on management properly accepting and discharging their ethical duty.

Psychology

The management of people requires interaction. Deming's postulate for ethically accomplishing this interaction requires that a manager must have an understanding of motivational as well as other psychological factors. Deming held that the early socialization processes of family life established self-esteem. He lectured on his personal belief that intrinsic motivation was superior and stronger than extrinsic forces. His "points" on training (6), education (13), abusive merit ratings and pride of workmanship (12) centered on management's ethical duty. But, of all of Deming's 14 points, the one he would probably privately admit was most important is point 8, "drive out fear." The kind of change required by Western industry could introduce fear of change, because a fundamental and systematic change is what is needed if the Western world is to remain competitive with Japan and the emerging Tigers of Southeast Asia. In downsizing, fear of job loss is felt at all levels of the organization. The ethical responsibility of management is to establish open communications so as to reduce the rumor mill and the "sickness of victimization." "No one can put in his best performance unless he feels secure" (Deming, 1982, p. 61).

Ethical decision making has its roots in moral philosophies. Deming's profound

knowledge is based on the fundamentals of psychology and is anchored in the "drive out fear" postulation. Clearly, Deming would never presume to invite himself anywhere, believing it to be both pretentious and unethical. He believed that unwanted advice is normally not accepted or even politely tolerated. Yet, Deming's U.S. adventure with such corporations as the Ford Motor Company features him visiting with the production employees and personally teaching them the theory of the transformation. On a regular basis, he went to great lengths to compliment others by making specific notes in his books or sending them personal letters and post cards. Self-esteem developed through intrinsic value systems was reinforced by Deming's gracious external validations of personal worth.

Domains of U.S. Ethics

In the early 1990s, the Joseph and Edna Josephson Institute of Ethics, enduring patron of the pursuit of defining a reference point or standard for U.S. ethics, convened a symposium in Aspen, Colo., to explore ethics. Many notable personages and personalities had been invited to the conference and at the end of the deliberations, they had narrowed the list and defined their terms. The domains of ethics they defined were: personal, cultural, religious, universal, and character. The defining terms of character were:

- Respect for Others
- Integrity
- Caring for Others
- Promise Keeping
- Honesty
- Responsible Citizenship
- Accountability
- Fairness
- Fidelity
- Pursuit of Excellence

These 10 terms were narrowed to six pillars, by combining some terms and eliminating others. The reconstituted six are: trustworthiness, respect, responsibility, justice and fairness, caring and civic virtue, and citizenship. These words, although meaningful in their own right, do not constitute a sufficient theory for

application. When Deming's 14 points are operationalized (put into practice), they develop a dynamic action that brings all of these terms into play along with many others. Deming believed that the foundation of knowledge was theory. With theory, predictions could then occur, observations be made, corrective action taken, and resultant ethics then practiced.

Philosophical Underpinnings

In her book, *The Keys to Excellence*, Nancy R. Mann reports that the beginnings of the Deming philosophy took place during World War II, at Aberdeen Proving Ground (Mann, 1988, p. 47). Deming would reminisce, remembering by name the young West Point officers that would gather on the porch of the officers barracks on Sunday afternoons to wax philosophical. Deming, was a deeply religious man giving much of his personal wealth to his Episcopal parish. Would it be far-fetched to believe that at times Deming and these young West Point officers would discuss the meaning and attributes of the Cadet Prayer? In part, it reads:

Strengthen and increase our admiration for honest dealing and clean thinking, and suffer not our hatred of hypocrisy and presence ever to diminish ... Make us to choose the harder right instead of the easier wrong, and never be content with a half truth when the whole can be won ... (United States Military Academy, 1950, p. 54).

Deming's first formal delivery of the 14 points took place in February 1985 at the U.S. Naval Air Rework Facility at North Island, San Diego, Calif. Fortunately for the young woman identified at the outset of this article, Deming's 14 points and philosophy became the cornerstone for Asian and then U.S. quality movements: hard work, study, cooperation, teamwork, and setting of long-term goals form a powerful force. For her, this philosophy resulted in a new life in a new nation. She is proud to admit her life has been significantly benefited by Deming's philosophy. And the pencil? Not everyone does!

Editor's Note: The author welcomes questions or comments on this article. Contact him at JGould@dote.osd.mil or gould_jay@dsmc.dsm.mil.

ENDNOTES

1. Deontology focuses on the preservation of individual rights and on the intentions associated with a particular behavior rather than on its consequences.
2. Teleology stipulates that acts are morally right or acceptable if they produce some desired result, such as the realization of self-interest or utility.

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Gansler Releases Commercial Business Environment Final Report



ACQUISITION AND
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MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
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ASSISTANT SECRETARIES OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
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DIRECTORS OF THE DEFENSE AGENCIES
PRESIDENT, DEFENSE ACQUISITION UNIVERSITY
COMMANDANT, DEFENSE SYSTEMS MANAGEMENT COLLEGE

SUBJECT: Section 912(c) Commercial Business Environment Final Report

In conjunction with the other related 912(c) efforts, I directed the establishment of a study group to develop a program aimed at recommending training on commercial business practices. Attached is the Final Report, *The Commercial Business Environment: Accelerating Change Through Enterprise Teaming*, which provides recommendations for an implementation strategy for adopting effective commercial business practices to achieve the Revolution in Business Affairs.

This is an important Report and contains many sound ideas. I am, therefore, directing the Deputy Under Secretary of Defense (Acquisition Reform) to take immediate action on the Report's key recommendations, each of which cumulatively should effect change in the way we currently conduct business:

- 1) Establish a Change Management Center (CMC) to take the lead in accelerating acquisition and logistics reform initiatives, while providing a resource for change management across the Department;
- 2) Explore using the CMC to help the Defense Acquisition University adopt key attributes of the corporate university approach to provide education and training for the acquisition, technology, and logistics workforce; and
- 3) Pursue and incorporate, where possible, cross-functional teaming across the Defense business enterprise to accelerate organizational goals and manage change.

For additional copies of the Report, please contact Mr. William Mounts at (703) 614-3882 or mountsw@acq.osd.mil. The Report may also be downloaded at <http://alpha.lmi.org/cbe/reports/>.

Attachment
As stated

J.S. Gansler

Editor's Note: This information is in the public domain at <http://www.acq.osd.mil/ar/#sat1>.

Service Commands Plan to Enhance Joint Interoperability

CLEO ZIZOS

FORT MONMOUTH, N.J. (Jan. 6, 2000)—One of three Joint Service offices has opened in the Myer Center here in response to a Pentagon initiative to enhance the interoperability of Command, Control, Communications, Computers and Intelligence (C4I) systems among the Army, Navy, and Air Force.

The offices, which are known as CINC (Commanders-in-Chief) Interoperability Program Offices (CIPO) are located in the C4I acquisition commands of the three Services—the Army's Communications-Electronics Command (CECOM) here; the Navy's Space and Naval Warfare Systems Command (SPAWAR), San Diego; and the Air Force Electronics Systems Center (ESC), Hanscom Air Force Base, Mass.

Following approval by the Under Secretary of Defense [Acquisition, Technology and Logistics] of a study in which CECOM participated with its counterparts in the Navy and Air Force, the three commanders and the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (C3I) entered an agreement outlining steps to improve joint interoperability.

Each office comprises 20 new positions, including 18 action officers (six from each Service). Col. Winthrop Cooper, formerly Operations Director of the CECOM Software Engineering Center, was named Fort Monmouth CIPO Director; and Anthony Lisuzzo, formerly director of the Survivability/Camouflage, Concealment and Deception Division of the Night Vision and Electronic Sensors

The objective is to ensure interoperability of systems from 'womb to tomb' and to modify already fielded systems when necessary.

Directorate of CECOM's Research, Development and Engineering Center, was named Deputy Director of the office.

"In the current environment of downsizing and general reduction of resources, it is imperative that we utilize current and emerging technologies to make the warfighter more efficient, survivable, and interoperable," Lisuzzo said. The new office reports directly to the deputy to the CECOM Commanding General.

"The objective is to ensure interoperability of systems from 'womb to tomb' and to modify already fielded systems when necessary to make them interoperable and capable of sharing information," Cooper said.

"This initiative is a real opportunity to provide help to the warfighter," he added.

"Our organization is committed to helping achieve the goal of interoperability of C4I systems for the CINCs."

Instead of engineering solutions themselves, each CIPO will direct issues to appropriate elements in their Commands for resolution.

The CECOM, SPAWAR, and ESC commanders have also established a Joint Forces Program Office (JFPO), which evaluates solutions for cross-CINC applications, focuses on the compliance of C3 systems with joint technical architecture, and recommends development of common products. The JFPO, which is initially located at SPAWAR, arranges for C4I experiments with the U.S. Atlantic Command, the executive agent for joint warfighting experimentation. The office includes action officers from CECOM, SPAWAR, and ESC. Location and staffing will be reviewed after a year.

Testbeds of the three Services—CECOM's Digital Integration Lab, SPAWAR's Maritime Battle Lab, and ESC's Command and Control Unified Battlespace Environment—are being used to test C4I systems for joint interoperability.

In a brief period, the CECOM CIPO has been successful in several endeavors in support of the CINCs with which it is aligned. These efforts have included on-site technical support of the U.S. Europe Command in the Combined Endeavor '99 exercises. In support of U.S. Southern Command (USSOUTHCOM), a combined effort led by this office and coordinated with the CIPOs at ESC and

Zizos is the Fort Monmouth Public Relations Officer, Fort Monmouth, N.J., (732) 532-1258. This information, released by the U.S. Army Communications-Electronics Command, is in the public domain.

SPAWAR resulted in a joint project, which captured the operational requirements for USSOUTHCOM's Caribbean Regional Operations Center (CARIBROC) Target C4I Architecture and identified the commercial off the shelf (COTS) and government off the shelf (GOTS) systems required to successfully meet and exceed mission requirements.

By supporting U.S. Forces Korea through the ULCHI FOCUS LENS '99 exercise, the CECOM CIPO produced an extensive technical study to upgrade the CINCs' Command Center TANGO (fixed site command center) and provided a draft Mobile Command Center design. Additionally, the office provided key updates to the Warfighter Information Network-Tactical Operational Requirements Document (WIN-T ORD) to provide a "joint interoperable" overview; and produced a listing of systems from the warfighting CINCs, which identify 20 percent of the systems creating 80 percent of the joint interoperability problems as witnessed by the CINCs.

These are just some of the initiatives that have been established within the CECOM CIPO to ensure interoperability among our joint/allied forces, as well as addressing some of our coalition partners' concerns.

Each CIPO works directly with specific regional CINCs to meet their C4I requirements. CECOM works with the U.S. Southern Command, U.S. European Command, U.S. Forces Korea, and U.S. Special Operations Command. The ESC works with U.S. Space Command, U.S. Transportation Command, U.S. Central Command, and U.S. Strategic Command; and the SPAWAR with the U.S. Atlantic and Pacific Commands.

"We at the CECOM CIPO, in conjunction with our sister Service CIPOs, are keenly aware of the need for jointness and interoperability across the Departments in order to achieve the goals and objectives delineated in Joint Vision 2010," Cooper said. "We are committed to making a contribution and fostering interoperable solutions."

DSMC 2000 Catalog Now Online!

The DSMC 2000 Catalog is now online at http://www.dsmc.dsm.mil/courses/cat_sch.htm. This year's catalog provides information on the college and its divisions; alumni association; regional centers; application procedures; course descriptions; key phone index; faculty and staff information; and other general information.

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DoD's Changing Roles

An Economic Perspective

VIRGINIA C. THOMPSON

Prior to a recent presentation I gave to fellow classmates at the Duke Executive Education Course, one of my classmates, Heidi (Dr. Heidi J. Dugan, VonRoll America, Inc.) described to me her first direct experience with the Department of Defense. Her company accepted a contract to destroy some DoD high-tech equipment, but they weren't expecting the two armed guards who routinely accompanied that equipment through destruction.

Her comment impressed me enough to tailor my remarks to managers of other companies represented in the class, such as Hewlett-Packard, AT&T, Consolidated Edison, Walgreen, and Deutsche Bank AG, who may not have had interaction with DoD. I proceeded to give the class a brief economic view of American defense that didn't exactly resemble what they see in the 20-second spot about Bosnia on the evening news. In other words, America's defense is made up of more than meets the eye. It takes a lot of ordinary, day-to-day business activities to support the armed forces that so capably defend our nation.

DoD Running to Keep Pace

The Department of Defense operates a monopoly in a particular service industry and takes seriously its responsibility to defend each one of us, our neighbors, and our corporate assets worldwide. Earlier in this century, DoD enjoyed a role as the single research and development funding/purchaser of high-tech/high-cost weapons. The Department was supported by numerous prime and sub-con-

tractors. During the past 10 years, companies across the nation have struggled to reinvent, reposition themselves, and to regain global leadership in the wealth-creating, high-technology/Internet world.

During that time, DoD's numerous prime contractors have merged with each other, shrinking our nation's competitive supplier base. In place of the Northrops, Lorals, Hughes, McDonnells, Boeings, Lockheeds, Raytheons, and a multitude of others, DoD now has just two: Lockheed Martin and Raytheon (the Department of Justice blocked the last Lockheed Martin-Raytheon proposed merger).

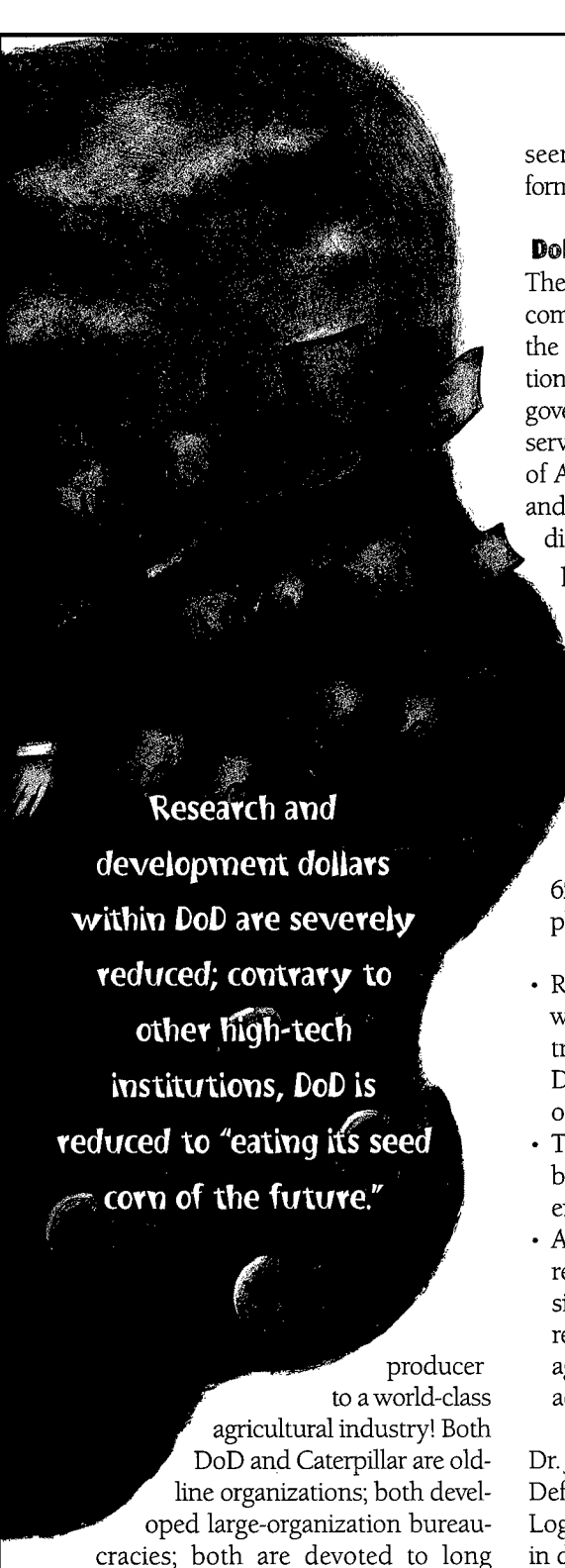
According to Professor Bill Boulding at Duke, the power relationship between producers and consumers has been reversed, with the multitude of Internet choices offered to consumers equating to control. While fulfilling its principal mission of readiness, DoD is running to keep pace with the marketplace. Moreover, the fact that I, a DoD employee, was attending a course developed for Fortune 500 upper executives as part of my career development, indicates the importance DoD places on its acquisition and contract management workforce staying one step

ahead of changing forces in the global marketplace.

DoD and Caterpillar Corporation

The Department of Defense shares characteristics with Caterpillar Corporation. During my course at Duke, our class studied Caterpillar's amazing transformation from a sleepy, farm-implement

Thompson is a civilian employee of the Department of Defense (DoD), serving a three-year managerial development assignment at the Army's Space and Missile Defense Command in Huntsville, Ala. Her experience is in negotiating and managing contracts, and in cost and program analysis. This article is based on a presentation she gave at Duke University, Fuqua School of Management, Program for Manager Development, July 1999. The Duke Executive Education Course, developed for Fortune 500 upper executives, was provided as part of her individual development plan through the Department of Army's Competitive Development CDG 97 Program.



seen is that DoD is also being transformed. The same *must* happen for DoD.

DoD - An Income Monopoly

The Department of Defense has an income monopoly — or used to have. For the last hundred or so years of our nation's history, DoD enjoyed the common government role of supplier of essential services. Congress used to be made up of American veterans who understood and strongly supported defense expenditures to protect their neighbors. Experience in the armed forces is declining in Congress as well as in DoD's civilian leadership. Previously, the Department received funding because the alternative was public destruction. With the Cold War went fear. Consider this:

- The DoD budget has dropped over 65 percent since 1984, its dollars replaced by the cost of social services.
- Research and development dollars within DoD are severely reduced; contrary to other high-tech institutions, DoD is reduced to "eating its seed corn of the future."
- The Department is also tossing out the bureaucratic legacy of a large, lagging enterprise.
- Along with industry, we have stopped remodeling ourselves as smaller versions of the old "doer" design and are retraining as smaller numbers of managers of commercial "contracting out" activities.

Dr. Jacques Gansler, Under Secretary of Defense (Acquisition, Technology and Logistics), believes we need more skill in decision makers of the future. "We'll have fewer doers and more managers."

DoD Operates in "Boom or Bust" Economy

The Department of Defense operates in a "boom or bust" economy. We either have a war or we don't. DoD accepts the challenge to be ready wherever an enemy attacks, and to reduce costs and infrastructure in between. Duke Professor Peter Brews commented on the WW II 5-percent success rate of bombs hitting

the right target and *Murphy's Law of Bombing*: "Bomb everything — high volume, low variety, high destruction, high cost, high collateral damage."

DoD has worked hard to make most weapons of mass destruction obsolete. We face a changing market. Currency alliances/warfare between countries to eliminate "outsiders" (Euromarket, American-made) are replacing some threats of mass destruction. But DoD can't be sure that war as we have known it is gone. We're handling several simultaneous small engagements, like the Balkans, while watching how India, China, and Pakistan use their nuclear capabilities.

Logistics Changing

Logistics will be different in the next war. We're looking at someone like FEDEX to deliver parts quickly to the battlefield. Already, DoD is contracting for commercial weapons developers to provide second- and third-level field repairs, with mandatory turnaround times. At the same time, we are purchasing development, production, and future (even battlefield) repairs from a single contractor.

A government logistics expert calls for a "robust partnership with the commercial sector industry." We have the first "professional" Army, training on Internet-technology world class weapons. Would a logical next step be to consider contracting for a commercial private army, perhaps with previous military experience? Dr. Gansler cautions us, "Don't make the assumption that you're going to do the same job with fewer people, because you're not. The processes must change."

DoD — Your Next New Market?

Are you a leader in your field, providing the services and technologies of the future? Can you manage what can't be planned? Check in with your Department of Defense. We might be your next new market.

Editor's Note: The author welcomes questions or comments on this article. Contact her at virginia.thompson@smdc.army.mil.

Research and development dollars within DoD are severely reduced; contrary to other high-tech institutions, DoD is reduced to "eating its seed corn of the future."

producer to a world-class agricultural industry! Both DoD and Caterpillar are old-line organizations; both developed large-organization bureaucracies; both are devoted to long established industries (war and agriculture). More importantly, both organizations depend on worldwide logistics support to provide their services.

In recent years, Caterpillar Corporation has turned to new technology and Internet access to transform their business. Moving from "caterpillar" speed to the speed of electronic wavelengths, this company has positioned itself to lead. What many companies may not have

Before DSMC, There Was DWSMC

From Tongue Point to Fort Belvoir — Chance Meeting with Kennedy-Johnson Era Executive, James N. Davis Sheds Light On DSMC's Origins

WILSON "CHIP" SUMMERS

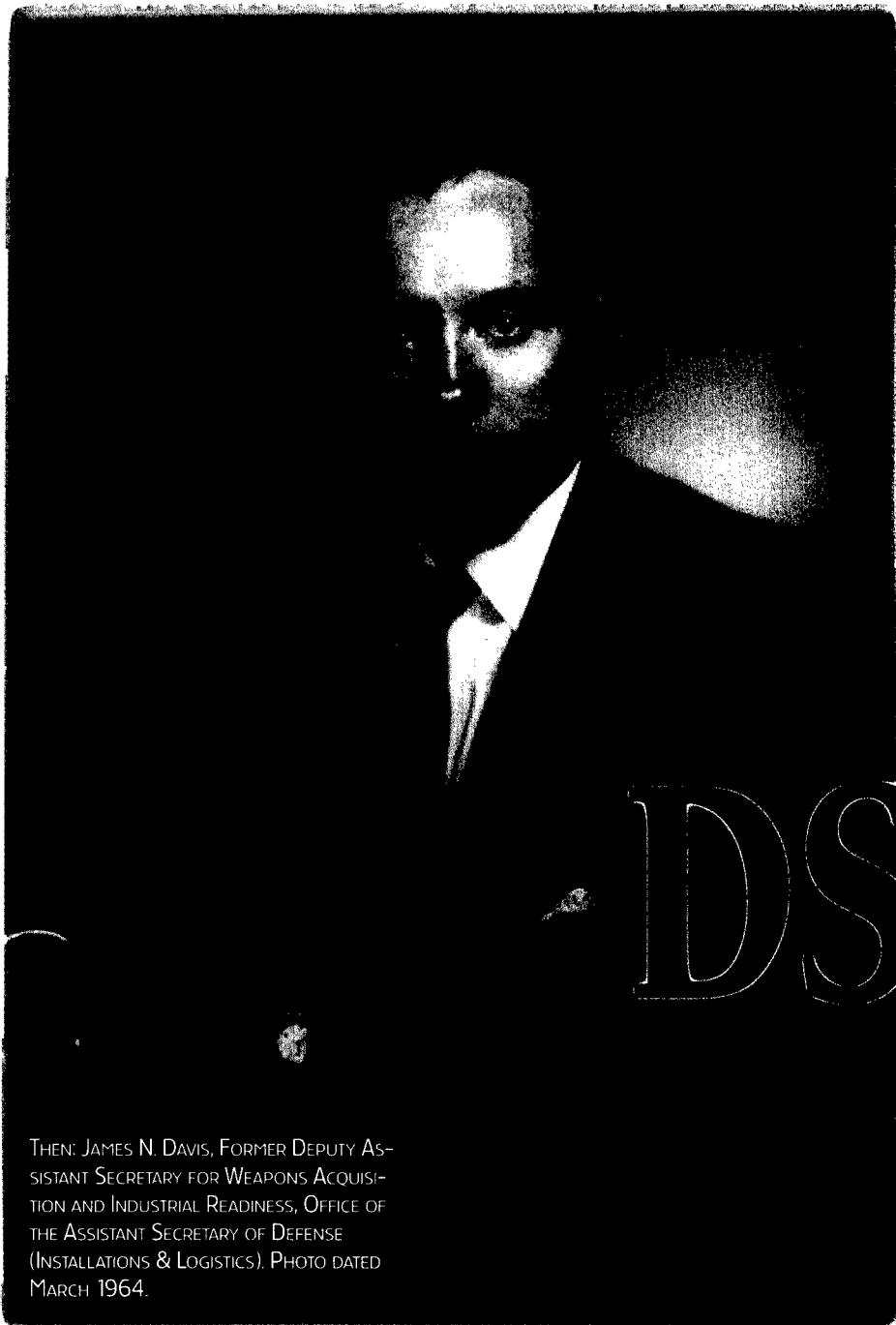
Those familiar with the establishment of the Defense Systems Management College (DSMC)¹ by Deputy Secretary of Defense David Packard in 1971 might not be aware that the requirement for a school to ensure that future program managers had the necessary management skills to effectively acquire weapon systems for the Department of Defense was first conceived in 1963.² Then Secretary of Defense Robert McNamara directed that a conference (New London Conference) be conducted on Program Management that led to the establishment of the predecessor to DSMC.³

A Chance Meeting

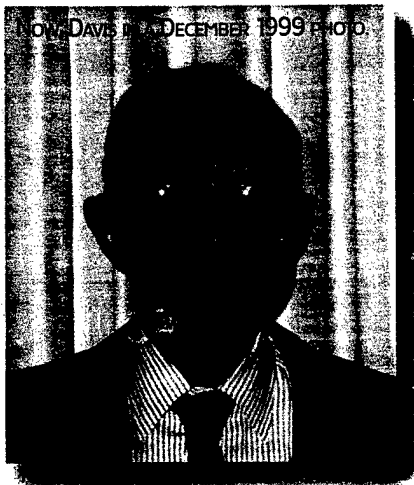
How I became aware of this little known fact, even though I have been teaching at DSMC for over 13 years, is by meeting one of the original forces behind program management education and the DSMC.⁴ It was a great day for golf, and since I was off from work I proceeded to the golf course without a tee time. The starter paired me with a nice couple and we were off to challenge our mental and physical capabilities. When I play with strangers, two questions inevitably come up: Where do you work and what do you do for a living?

It is not easy providing answers to these questions to people not familiar with weapon systems acquisition, which is the vast majority of the population. So I was pleasantly surprised by my playing partners' understanding not only of the acquiring of weapon systems, but also

Summers is Department Chairman, Contract Management Department, Faculty Division, DSMC.



THEN: JAMES N. DAVIS, FORMER DEPUTY ASSISTANT SECRETARY FOR WEAPONS ACQUISITION AND INDUSTRIAL READINESS, OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS & LOGISTICS). PHOTO DATED MARCH 1964.



A New Institution

The New London Conference, held in the summer of 1963, reaffirmed that the same management skills are necessary to manage programs regardless of Service affiliation. To ensure the necessary management skills would be developed by future program managers, the Deputy Secretary of Defense directed in September 1963, the establishment of a systems/project management education and training institution.

Davis assumed leadership for organizing a Defense Weapon Systems Management Center (DWSMC) to meet the needs for program management education. Political pressures at the time highly suggested that the new school be located in Oregon. So Davis and his exploratory team proceeded to Tongue Point, Oregon, a closed down seaplane training base, to assess its suitability. Fortunately, they found it unsuitable for several reasons:

- Not easily accessible for students.
- No readily available pool of faculty.
- No locally available guest speakers.
- Expensive to operate.
- Lack of sunshine.

However, they still had to cope with the politics of locating something in Oregon. Locating an Indian High School at the sea base, in lieu of an acquisition school, was recommended and accepted to the satisfaction of all parties involved.

Next — Where to put the new school? Davis and his team suggested Fort Belvoir, Va., because of its proximity to Washington, D.C. That idea was rejected because Fort Belvoir already had the Army Management School. The Air Force offered up facilities at Wright-Patterson Air Force Base, Ohio, which were accepted.

Air Force Hosts Inaugural Class for DWSMC

In March 1964, Davis assigned the Air Force responsibility for establishing and

operating the DWSMC. The faculty was jointly staffed and included both military and civilians. The commandant was an Air Force colonel, with two deputies — one Navy and one Army. The school was the only joint school that addressed weapon systems planning, acquisition, and support from the frame of reference of a single managerial responsibility. The first class was composed of 18 students from each of the three military departments. That first class graduated in December 1964.

Davis conceived that the school would satisfy three goals:

- Teach students how to communicate effectively on a day-to-day basis with superiors and others throughout the acquisition community.
- Orient the student regarding the philosophy of complex systems acquisition, by explaining the inter-relationships of the many activities and pieces of a system that must be synchronized in work, test, and delivery if the entire system is to function in the field.
- Keep in close touch with actual practices in the military departments and industry for currency, and act as a change agent for identifying and explaining new methods and practices.

The goals that Jim Davis established over 35 years ago are still followed at the Defense Systems Management College today.

END NOTES

1. The Defense Systems Management College was officially established at Fort Belvoir, Va., July 1, 1971.
2. Acker, David D., *A History of the Defense Systems Management College* (Defense Systems Management College, Fort Belvoir, Va., 1986).
3. Final Report of the Conference on Program Management (Department of Defense, 1963).
4. Interview with Jim Davis by Chip Summers, November 1999.



to the education and training of the personnel that do the acquiring. As I later discovered, I was playing golf with James N. Davis, former Deputy Assistant Secretary for Weapons Acquisition and Industrial Readiness during the Kennedy-Johnson Administrations.



Selected Acquisition Reports

As of September 1999

The Department of Defense has released details on major defense acquisition program cost and schedule changes since the June 1999 reporting period. This information is based on the Selected Acquisition Reports (SAR) submitted to the Congress for the Sept. 30, 1999, reporting period.

SARs summarize the latest estimates of cost, schedule, and technical status. These reports are prepared annually in conjunction with the President's budget. Subsequent quarterly exception reports are required only for those programs experiencing unit cost increases of at least 15 percent or schedule delays of at least six months. Quarterly SARs are also submitted for initial reports, final reports, and for programs that are re-baselined at major milestone decisions.

The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operation and maintenance. Total program costs reflect actual costs to date as well as anticipated costs for future efforts. All estimates include allowances for anticipated inflation.

The current estimate of program acquisition costs for programs covered by SARs for the prior reporting period (June 1999) was \$706,935.6 million. After adding the costs for one new program, Navy Theater Wide in June 1999, the adjusted current estimate of program acquisition costs was \$711,399.9 million. There was a net cost decrease of \$1,250.5 million during the current reporting period (September 1999). The cost changes between June 1999 and September 1999 are summarized below:

	Current Estimate (\$ in Millions)
June 1999 (71 programs*)	\$706,935.6
Plus one new program, NTW (Navy Theater Wide)	+4,464.3
June 1999 Adjusted (72 programs*)	\$711,399.9

**Excludes classified costs for the Air Force's MILSTAR program.*

Changes Since Last Report

Economic	+\$5.8
Quantity	-1,332.3
Schedule	+4.1
Engineering	-0.4
Estimating	+67.1
Other	0.0
Support	+5.2
Net Cost Change	-\$1,250.5

September 1999 (72 programs*)\$ 710,149.4

For the September 1999 reporting period, there were quarterly exception reports submitted for 13 programs. The Air Force's AEHF (Advanced Extremely High Frequency) was the only program reporting for the first time; however, SBIRS Low (Space Based Infrared System - Low) was added as a new component to an existing SAR program. For the remaining 12 programs, there was a net decrease of \$1,250.5 million (-0.8%),

due primarily to a quantity reduction in the Navy's JSOW (Joint Standoff Weapon) Unitary variant. Details of the changes for these 12 programs are as follows:

Army

ATACMS-BAT (Army Tactical Missile System) – The SAR was submitted to report a 14-month slip in the completion of developmental test (DT)/operational test (OT) from April 1999 to June 2000. During developmental testing (DT-1 and DT-2), test anomalies occurred; therefore, an additional DT flight (DT-3) is planned for June 2000. Program costs increased \$3.9 million (+0.06%) from \$6,252.6 million to \$6,256.5 million, due primarily to reflect revised estimates for negotiated costs of the BAT production contract. The increases were partially offset by a quantity reduction of 116 BAT submunitions from 19,554 to 19,438.

BRADLEY UPGRADE (Fighting Vehicle) – The SAR was submitted to report a schedule slip in the start of Initial Operational Test and Evaluation (IOT&E) from September 1999 to August 2000 to allow integration of Embedded Battle Command (EBC) software prior to testing. No cost changes were reported; however, the Army is evaluating the impact of this slip.

MLRS UPGRADE (Multiple Launch Rocket System) – The SAR was submitted to report a delay in the start of operational test (OT) from January 1999 to September 2001 to reflect a restructure in the M270A1 test program. The Army is evaluating the cost impacts of this slip and will report any increases in future SARs. Other program costs increased \$0.6 million (+0.01%) from \$4,933.9 million to \$4,934.5 million, due primarily to FY1999 reprogrammings.

**Excludes classified costs for the Air Force's MILSTAR program.*

SMART-T (Secure Mobile Anti-Jam Reliable Tactical - Terminal) – The SAR was submitted to report schedule delays of more than six months associated with the failed launch of the MILSTAR Flight-3 satellite. Specifically, the Medium Data Rate (MDR) follow-on test and evaluation (FOT&E) slipped from October 1999 to October 2000. A functional MDR Satellite is required to perform SMART-T FOT&E, and the next launch is scheduled for May 2000. The Army is evaluating the cost impacts of this slip and will report any increases in future SARs. Other program costs decreased \$2.1 million (-0.3%) from \$764.2 million to \$762.1 million, due primarily to a quantity decrease of two terminals from 320 to 318.

Navy

AV-8B REMANUFACTURE (Harrier II) – The SAR was submitted to report a delay in the Navy Support Date from March 1999 to October 2002, due to procurement restructuring caused by budget cuts. No cost changes were reported.

DDG 51 (Guided Missile Destroyer) – The SAR was submitted to report a rescheduling of Initial Operational Capability (IOC) for the first Flight IIA ship (DDG-79) from October 2000 to October 2001. This 12-month revision is required primarily because of complexities associated with the Flight IIA design/construction, and introduction of major combat systems and ship performance improvements. No cost changes were reported.

JSOW (Joint Standoff Weapon) – The SAR was submitted to report a restructured JSOW Unitary program, which resulted in schedule delays of greater than six months. Specifically, the start of System Flight Test slipped from January 1999 to January 2001. Program costs decreased \$1,268.0 million (-17.4%) from \$7,285.3 million to \$6,017.3 million, due primarily to a quantity reduction of 4,800 Unitary variants from 7,800 to 3,000 weapons.

LPD 17 (Amphibious Assault Ship) – The SAR was submitted to report an expected 10-month schedule slip in Lead Ship Delivery from November 2002 to September 2003, and slips in other related milestones.

The lead ship schedule slip was caused by difficulties with and lack of progress on the detail design effort. There were no net cost changes reported as a result of the schedule delay.

Air Force

B-1 CMUP (Conventional Mission Upgrade Program) – The SAR was submitted to report schedule slips of greater than six months to the Computer Upgrade and Defensive System Upgrade (DSUP) programs. The Avionics Flight Software (AFS) development for the Computer Upgrade program slipped 8½ months. This delay is needed to assure mature software is available at start of Flight Test in March 2000. The late delivery of government-furnished equipment (GFE) from the Navy's Integrated Defensive Electronic Countermeasures (IDECM) will cause an 11-month slip to the completion of DSUP Engineering and Manufacturing Development (EMD). The full rate production decision (Milestone III) will be delayed from April 2002 to March 2003. Program costs increased \$45.7 million (+2.2%) from \$2,117.0 million to \$2,162.7 million, due primarily to the 8½-month AFS development schedule slip.

JASSM (Joint Air-to-Surface Standoff Missile) – The SAR was submitted to report the extension of Engineering and Manufacturing Development (EMD) by 10 months. The Teledyne engine development/modification process is progressing at a pace slower than planned due to bearing, digital fuel control, and compressor design issues. Also, several key subcontractors are delivering items late due to configuration changes made by Lockheed Martin. Lastly, two unplanned development flight tests are required because of design changes. No cost changes were reported.

SBIRS (Space Based Infrared System) – The SAR was submitted to incorporate SBIRS Low, which was approved for Program Definition and Risk Reduction (PDRR) in August 1999. This represents a new SBIRS component and is reported below under New SARs.

DoD

PATRIOT PAC-3 (Patriot Advanced Capability)– The SAR was submitted to report schedule delays of greater than six months in the Configuration 3 Ground System Testing due to software maturity issues. Potential cost impacts from this slip are being evaluated and will be reported in future SARs. Other program costs decreased \$2.5 million (-0.03%) from \$7,778.3 million to \$7,775.8 million, due primarily to budget reductions.

New SARs (As of Sept. 30, 1999)

The Department of Defense has submitted an initial SAR for one new program, Advanced Extremely High Frequency (AEHF), and for one new component of an existing SAR, Space Based Infrared System – Low (SBIRS Low). These reports do not represent cost growth. The baselines established on these programs will be the points from which future changes will be measured. The current cost estimates are provided below:

Program	Current Estimate (\$ in Millions)
AEHF (Advanced Extremely High Frequency)	\$2,690.6*
SBIRS Low (Space Based Infrared System - Low)	4,223.2
Total	\$6,913.8

* Pre-Milestone II program reporting development (RDT&E) costs only, in accordance with the provisions of Section 2432, Title 10, United States Code.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

DSMC PUBLISHES LONG-AWAITED HISTORY OF U.S. WEAPONS ACQUISITION

ARMING THE EAGLE

The mission of the Defense Systems Management College — to educate and train weapons acquisition professionals — includes the responsibility to disseminate information on defense acquisition. In this role, DSMC is pleased to announce the publication of *Arming the Eagle: A History of U.S. Weapons Acquisition Since 1775*, the first and only book DoD has ever commissioned on this subject.

Written by retired DSMC professor Wilbur D. Jones Jr., *Arming the Eagle* is a series of essays, or snapshots, of various periods in the country's military history. The essays tell the story of how U.S. weapons were developed and produced, what notable managers and organizations were involved, and which weapons from those periods significantly impacted national conflicts.

Applicable space is given to the Army, Navy, Marines, and Air Force to illustrate the time capsules being reported. Those capsules include the American Revolution; the naval wars and War of 1812; antebellum acquisition and the War with Mexico; the Civil War;

the all-steel, all-steam new Navy; the Army's late Nineteenth Century reorganizations and War with Spain; World War I; the period between the wars; World War II; the nuclear age and Korean War; Vietnam and acquisition reform; the Persian Gulf War; and recent acquisition programs.

Arming the Eagle is a "wide-angled view" with utilitarian application for professionals in government and defense industry, by academicians and students, and by the media and general public. No previous knowledge of acquisition is required, terminology is explained, and the outcome of each segment and chapter reaches certain conclusions, or lessons, for students of history.

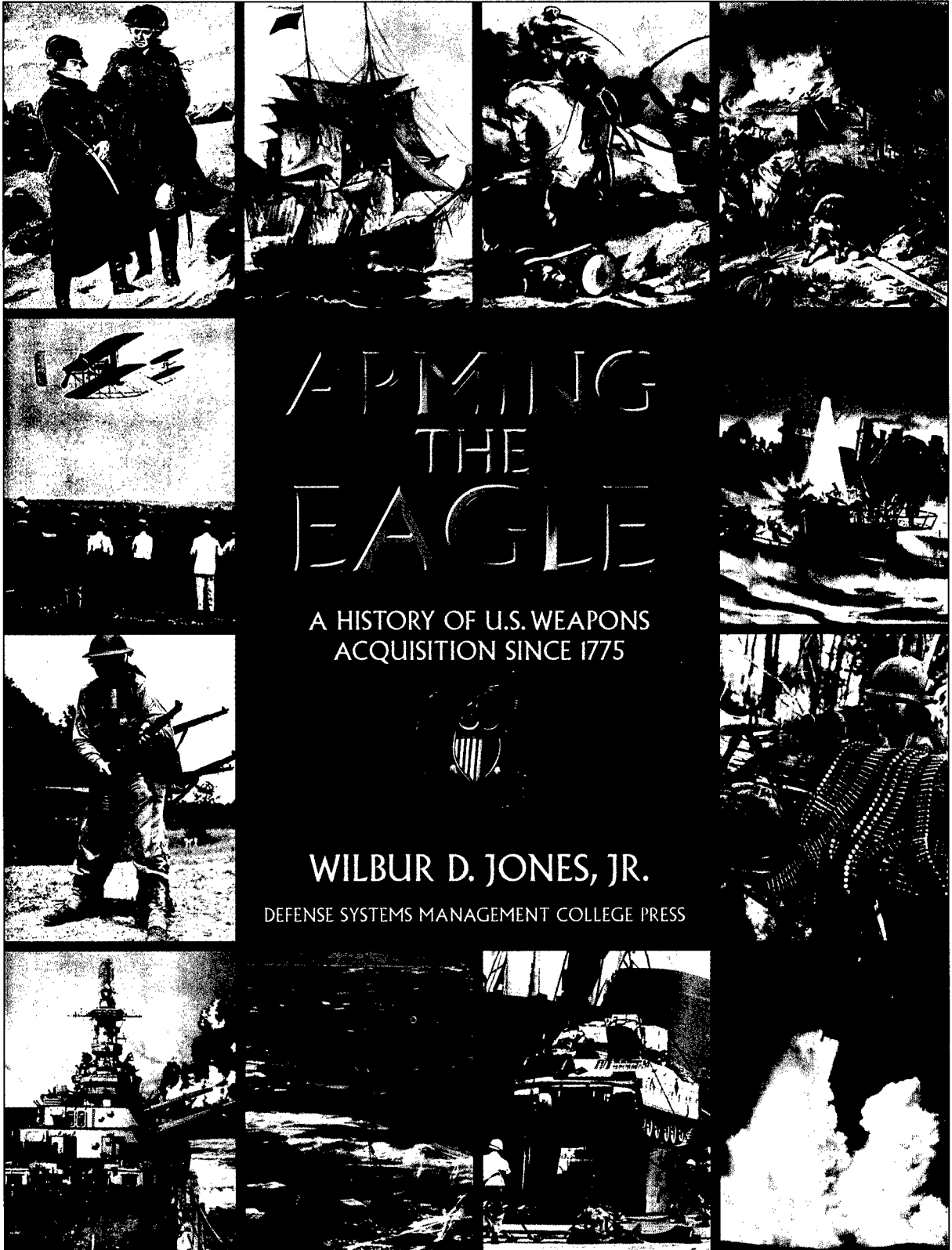
Order from DSMC for a limited time at \$35.00 plus \$3.00 shipping and handling, by *check only*, payable to the U.S. Treasury. Contact the Office of the Dean, Administration & Services, Building 202, DSMC Fort Belvoir, Va., campus. Call (703) 805-2151 or DSN 655-2151 for details.



RETIRED DSMC PROFESSOR WILBUR D. JONES JR., SIGNS COPIES OF HIS BOOK, *ARMING THE EAGLE: A HISTORY OF U.S. WEAPONS ACQUISITION SINCE 1775*, WHILE VISITING THE DSMC MAIN CAMPUS, FORT BELVOIR, VA., DEC. 2. SEATED FROM LEFT: DONNA RICHBOURG, PRINCIPAL ASSISTANT DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION REFORM); JONES; DR. GERTRUDE MCBRIDE EATON, DEFENSE ACQUISITION UNIVERSITY (DAU) BOARD OF VISITORS CHAIRPERSON. STANDING FROM LEFT: GREG CARUTH, DIRECTOR, VISUAL ARTS AND PRESS DEPARTMENT, DSMC; DEBBIE GONZALEZ, EDITOR, *ARMING THE EAGLE* AND *ACQUISITION REVIEW QUARTERLY JOURNAL*; THOMAS CREAN, PRESIDENT, DAU; DR. JAMES MCMICHAEL, DIRECTOR, ACQUISITION EDUCATION, TRAINING AND CAREER DEVELOPMENT.

ARMING T

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THE EAGLE

ALL FIND INSIDE...

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A Tribute to Sheer Determination: The Role of Acquisition in the American Revolution, 1775-1783

CHAPTER 2

Barbary Pirates and Other Naval Wars: Ship Acquisition in National Maritime Defense, 1794-1815

CHAPTER 3

Camels, Pontoons, and Interchangeable Parts: Military Enterprise and Antebellum Acquisition, 1815-1865

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Inventive Genius and New Appliances of War: Technology and the Union Army, 1861-1865

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All-Steam, All-Steel: White Squadron to Great White Fleet: America Acquires a New Navy, 1878-1909

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Depreciation, Deficiencies, and Disarmament: Pacifism and Acquisition Between the Wars, 1919-1941

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CHAPTER 13

"Horror Stories" of Toilet Seats and Coffeepots: Reforming Acquisition after Vietnam, 1964-1989

CHAPTER 14

"The Come-as-You-Are" War: Force Modernization, Preparedness, and Logistics Support in the Persian Gulf, 1990-1991

CHAPTER 15

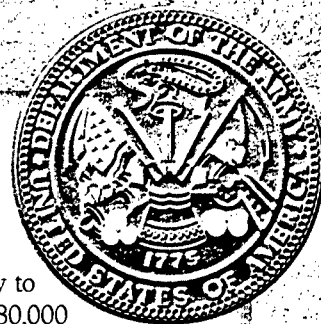
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APPENDIX

"Fifi" Flies: Classics That Won the War Still Thrill



FAIR List Released to Public

WASHINGTON (Army News Service, Jan. 5, 2000) — A list of Army functions deemed "commercial" in nature, and thus possibly susceptible to outsourcing, was released to the public last week.

The Federal Activities Inventory Reform list, originally expected to be released in November, was made available Dec. 30 by the Office of Management and Budget. OMB released the FAIR list for 21 federal agencies — including the Army — with an announcement in Thursday's [Dec. 30, 1999] *Federal Register*.

Under the FAIR Act of 1998, each federal agency was required annually to make available to the public a list of functions judged to be "not inherently governmental" and as such possibly able to be performed by contractors. This was the first such list compiled, officials said.

Paper and CD-ROM copies of the FAIR list were provided to 16 public libraries in the Washington, D.C., area, to include county libraries in Virginia and Maryland. The list was also made available at the Library of Congress and the Pentagon Library, and can be viewed on the FAIRNET Web site at <http://gravity.lmi.org/dodfair>.

In addition, officials said more information about the Army's FAIR List is available at another Web site, <http://www.asamra.army.pentagon.mil/FAIR/> and a DoD hotline number for more FAIR Act information has been activated at (703) 917-7431.

The Army's FAIR list contains functions now performed by more than 221,000 civilian employees, officials said.

A large portion of the Army's civilian jobs — about 84 percent — had to be included on the FAIR list, Dr. John Anderson said, in light of the legal definition for "inherently governmental." He said this term refers to positions which involve, among other things, interpreting and executing the laws "so as to bind the United States to take or not take some action."

Anderson is the Army official at the Pentagon responsible for the Army FAIR list.

In addition, Anderson said just because a job is "not inherently governmental" does not mean that it would

be in the "best interest" of the Army to contract it out. In fact, he said about 80,000 of the jobs on the list are exempt from cost comparison requirements or outsourcing because many of the functions are considered by the Army to be "core capabilities."

"The decision as to which commercial functions represent 'core capabilities,' and thus should be retained in-house, remains with the agency head," according to an OMB statement in the June 24 *Federal Register*.

Anderson explained that even if a function is coded on the FAIR list as being contractible, that doesn't necessarily mean it will be outsourced or even considered for outsourcing. But he said some of the jobs will be reviewed to determine the most efficient method of performing the work — by an in-house workforce or by contract.

During the Defense Quadrennial Review, the Army agreed to review 73,000 positions under A-76 competitions or through other methods over the next five years.

Anderson said the Army has already contracted out a significant portion of its functions. He said there are approximately 269,000 contractor employees performing functions for the Army.

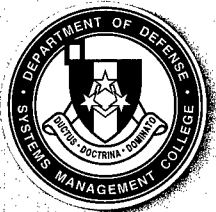
The announcement of the FAIR list in the *Federal Register* opened a 30-day public challenge period, officials said. Under Section 3 of the FAIR Act, the decision to include or exclude a particular activity from the DoD inventory is subject to challenge and possible appeal.

With the publishing of the list, an interested party may submit a written challenge within 30 calendar days. This public challenge period ends Jan. 31.

Editor's Note: This information is in the public domain at <http://www.dtic.mil/armylink/news>.

PM

Program Manager Magazine is the ideal forum for publishing your next article on acquisition reform, acquisition legislation, or acquisition current policies and practices. You are the subject matter experts – send us your successes, failures, lessons learned, or long-range vision for what may or may not work and why. In the process, gain peer exposure and recognition as a subject matter expert in your field. We want to hear from you and your associates – today.



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JDAM Program Office Named Best in Air Force

JAKE SWINSON

EGLIN AIR FORCE BASE, Fla. (AFPN) — The Joint Direct Attack Munitions Systems Program Office here won the 1999 Gen. Bernard A. Schriever Award as the best Program Executive Office program in the Air Force.

The award is based on an evaluation of customer focus, management and analysis, human resource development and management, long-range strategic planning, and customer satisfaction. A PEO program is a top priority in which the director reports directly to a Program Executive in the Pentagon, bypassing levels of command.

The JDAM SPO is small for managing a multibillion dollar program — consisting of 36 military, civil service, and contractor personnel. Traditionally, programs the size of JDAM have been managed by SPOs having more than 150 people.

Oscar Soler, JDAM program director, said this organization's size is one of its strengths when coupled with acquisition reform measures and commercial business practices.

"All my people are multi-talented and can do more than one job," Soler said. "When I travel, I don't worry about what is going on in the SPO back at Eglin [Air Force Base, Fla.]. I know they can handle whatever comes along. Boeing Corporation, our prime contractor, also has superb men and women [who] we consider a vital part of our JDAM Team."

During the recent Kosovo campaign, the JDAM team was called on by top defense officials to accelerate production of the 2000-pound, Global Positioning System-guided weapon. The program began in 1994, but was already in low-rate production when the Kosovo campaign began.

There were not many JDAMs in the inventory, but suddenly it became the "weapon of choice" by com-

bat aircrews. Its accuracy and adverse weather capability put it in great demand by aircrews flying night missions in the bad weather of the Balkans.

When the request to accelerate production reached Eglin, the JDAM team achieved an unparalleled feat in government contracting.

"After we got the word to accelerate deliveries and increase the quantity," Soler said, "we completed a contract in nine hours with Boeing to ramp up and produce more JDAMs. This normally takes 90 days."

JDAM was the first bomb dropped in the Balkan campaign. B-2 bombers loaded with JDAMs were flying 30-hour round-trip combat missions from Whiteman AFB, Mo. The weapons were being used as fast as they came off the Boeing assembly line, and by the time the war ended, 652 JDAMs had been dropped.

"The feedback we received from our customers, the warfighters, was that it was even more reliable and accurate than they expected," Soler said. "They were extremely pleased with its performance."

According to Roy Handsel, a contractor on the JDAM team, competition for the Gen. Benard Schriever Award is rigorous.

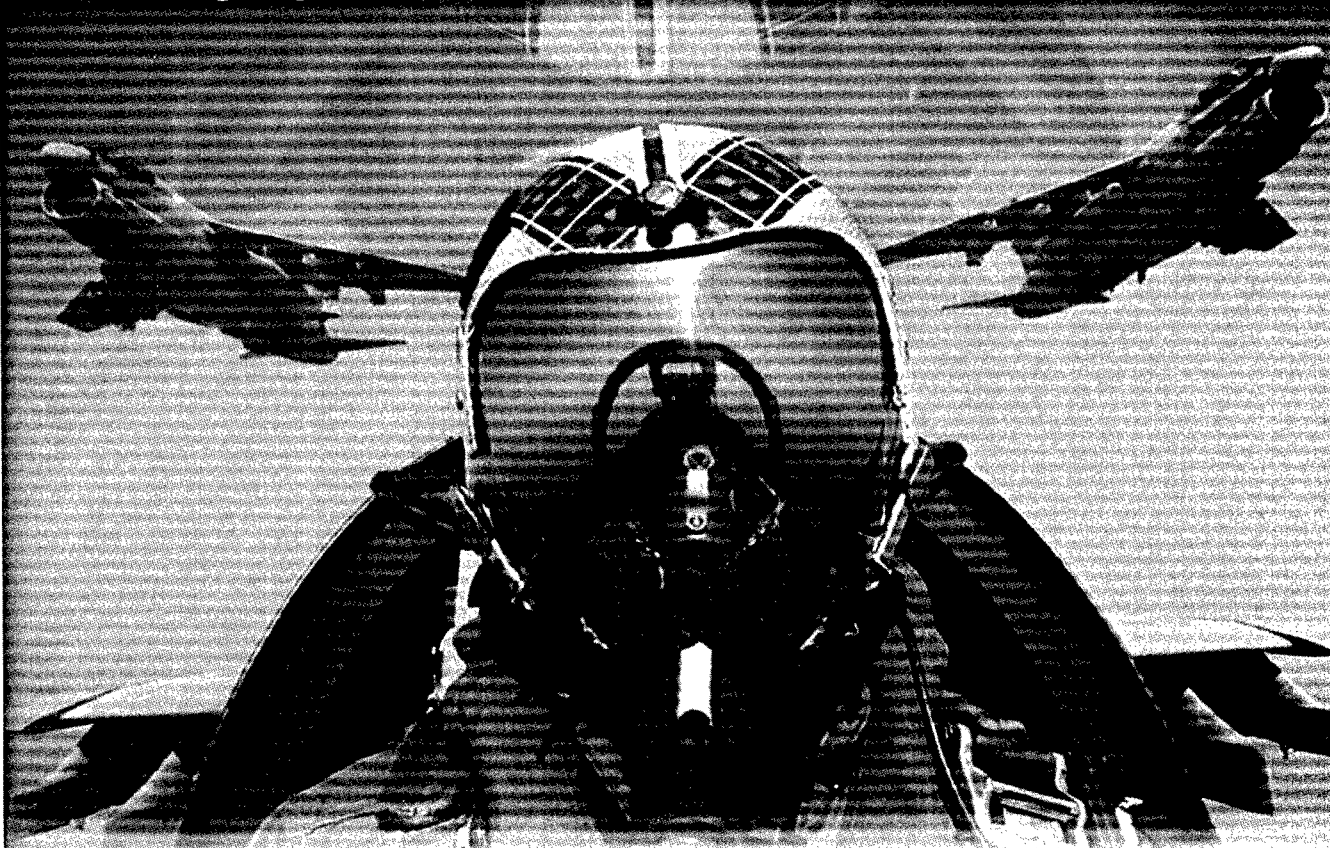
"Approximately 40 major PEO programs vie for the honor, and we are proud to bring it to Eglin," he said.

"I am very proud of the men and women of JDAM," Soler added. "When you consider we were competing with such programs as the F-22, C-17, AMRAAM, and Airborne Laser it is quite a tribute. I am extremely pleased."

Editor's Note: Swinson is with the Office of Public Affairs, Air Armament Center. This information is in the public domain at <http://www.af.mil/news>.

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DoD, Industry, MIT Set Sights on Ensuring Military Might

"Economic Incentives for Systems in Production"

J.C. KREIDEL

According to Wesley L. Harris, bridging the gap between the government and contractors is as simple and as critical as a cultural change. By first developing an open, trusting environment — before producing actual weapon systems — government and contractors can assure warfighters have the very best. It's all about playing on the same team.

He should know. Harris, a respected professor of Aeronautics and Astronautics from MIT, has a long list of credentials, which include Director of the Lean Sustainment Initiative and Co-Director of the Lean Aircraft Initiative.

Harris delivered his presentation, "Economic Incentives for Systems in Production," Jan. 6 at the DSMC Waelchli Room to a group that included the DSMC Commandant, Air Force Brig. Gen. Frank Anderson Jr., and other DSMC faculty.

DSMC has been involved in the project since 1993. Tom Shields, a former DSMC instructor, was a faculty member involved with LAI and continues to work on the project from MIT.

Harris' presentation was built on an LAI-sponsored study that compared six case studies in three categories within the defense aerospace field. The study focused on production programs, and central to the study was determining how pro-



FROM LEFT: PAUL McMAHON, PROFESSOR OF PROGRAM MANAGEMENT AND LEADERSHIP, DSMC, DISCUSSES LAI WITH AIR FORCE BRIG. GEN. FRANK ANDERSON JR., DSMC COMMANDANT, AND WESLEY L. HARRIS, PROFESSOR OF AERONAUTICS AND ASTRONAUTICS, MIT.

duction costs could be minimized while allowing contractors a share in the benefits.

Motivation

The driving force behind the study was simple: a win-win solution, with gains for both government and contractors. Getting on the same sheet of paper was

the first step. "The need to have a total enterprise view or systems view of what you're doing certainly is well in focus," said Harris. "[What we] want is a bottom line discussion of recommended policy change, based on rigorous research along with a need for a cultural change. How should we do business today for success compared to how we did business prior

Kreidel is editor, Program Manager magazine, Division of College Administration and Services, DSMC. A former Sailor, she is a Chief of Naval Information (CHINFO)-award winning writer and editor.

to acquisition reform is an important question."

The LAI, a consortium of industry, government, labor, and academia, primarily from MIT, provides a neutral forum for change within the defense aerospace arena. From this, members targeted areas for research to better identify lean practices, ultimately producing policy recommendations for those areas deemed ineffective.

These policy recommendations stemmed from study findings and attempted to capture best practices. Importantly, comments from both industry and government, from the top leadership to the shop floor, were included as a means of capturing the total systems view.

One result of this study is the realization that government and contractors shared the same goal, despite adversarial relationships common before acquisition re-

form. Contractor incentives included pleasing the customer, planning stability and cash flow, while the government counted among its priorities reduced production and life cycle costs, and systems of at least equal performance. Bridging the gap was the objective of maintaining the country's military might with well-equipped warfighters.

"The big problem before acquisition reform was that the contractual relationship, or the relationship between the contractors and the customer were so bad that the strategies did not lead to the kind of behavior that we wanted," said Harris.

Despite the common goal, contractors found themselves in the difficult position of making do with smaller profits in order to meet customer expectations. Furthermore, when faced with the possibility of adopting customer lean practices, it was only at serious financial losses to themselves. Any cost reductions were "captured" solely by the customer.

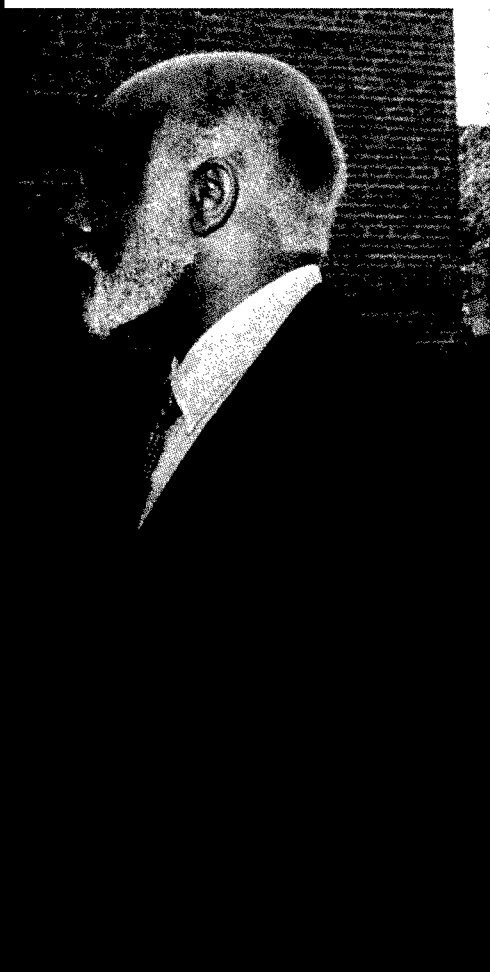
Conversely, the government as a customer was unable to encourage contractors to make lean practice changes out of pocket. Harris posed this question: "How do you get a company to invest [its] own funds to become lean if reducing costs means reducing profits?"

Getting to the root of the problem quickly is imperative said Harris as, "Economically incentivized acquisition is not only possible, it is essential to the health of the defense enterprise including customer, contractor, and taxpayer."

Key Questions

LAI was interested in establishing a common playing field with the customer and contractor working together. With these elements in mind, LAI had the following questions:

- What are the primary strategies, barriers, enablers, and relationships of economically incentivized procurement of weapon systems in production?
- When production costs are reduced, how can contractors share in the benefits?



An open, trusting environment between customer and contractor could yield a number of tanks or missiles or aircraft or ships at significantly reduced price and related cost savings. An open, trusting environment is priceless. It is the only glue that can [bind] customer and contractor and produce a win-win outcome.

LEAN AEROSPACE INITIATIVE

- A consortium comprising industry, government, labor, and members from academia.
- A neutral forum for dialogue on change and improvement in the defense aerospace enterprise.
- Identifies lean practices for the defense aerospace enterprise through research and data gathering.
- Produces policy recommendations where current policy and/or practice inhibit the embrace of lean practices.

WESLEY L. HARRIS, Ph.D.

**Professor of Aeronautics
Massachusetts Institute of Technology (MIT)**

Harris is currently Professor of Aeronautics, Director of the Lean Sustainment Initiative, and Co-Director of the Lean Aircraft Initiative at the Massachusetts Institute of Technology, Cambridge, Mass. Prior to rejoining MIT as Professor of Aeronautics, he served as Associate Administrator for Aeronautics, responsible for all programs, facilities, and personnel in Aeronautics at NASA.



Harris was Vice President and Chief Administrative Officer of the University of Tennessee Space Institute (UTSI) in Tullahoma, Tenn., from 1990 to 1993. From 1985 to 1990 he served as Dean of the School of Engineering and Professor of Mechanical Engineering at the University of Connecticut. Early in his career he held a number of faculty and administrative positions at MIT.

His academic research is associated with unsteady aerodynamics, aeroacoustics, and rarefied gasdynamics. Harris has worked with government and industry to design and build research and development programs, centers, and institutes for the effective transfer of technology. Additionally, Harris is credited with more than 100 technical papers and presentations.

Harris holds a Bachelor of Science degree in Aerospace Engineering from the University of Virginia; and a Master of Arts and a Doctor of Philosophy degree in Aerospace and Mechanical Engineering from Princeton University.

Technical difficulties also ran rampant within the airframe case studies. Instability was noted in budget and technical requirements areas. Further exacerbating the situation were an adversarial relationship in one airframe case study and a lack of mission for the aircraft in the other.

The engine case studies listed budget instability, non-value added oversight, acquisition reform-generated anxiety, commercial practices-generated anxiety, and increasing unit prices.

Ultimately, LAI distilled a few key barriers, noting that they are the sources of program uncertainty:

- Technical Difficulties
- Budget Instability
- Cost Overruns
- Adversarial Relationships
- Anxieties
- Technical Requirements Instability.

To overcome problems, Harris noted several times the belief that government and contractors should act as one team. Harris' research shows that the primary enablers in economically incentivized contracting are:

- Open, Trusting Environment
- Effective Lean Leadership
- Effective Use of Lean Joint IPTs
- Acquisition Reform.

Results

The adversarial relationships of pre-acquisition reform days can be shed for partnerships of mutual respect and trust, stemming from Integrated Project Teams made up of personnel from both sides — two sides, but one team.

By leveling the playing field, the government and contractors gain several advantages:

U.S. Government

- Technically Sound Systems
- Reduced Cost
- Most Competitive Product
- More Complete Understanding of Contractors' Goals and Constraints
- Potential for Additional Cost Reduction.

- What practices motivate defense aircraft contractors to invest more of their resources to become lean?
- What are the lessons learned in these studies? Are they transferable to other procurements?

Data Sources

The LAI study compared six case studies in three categories: munitions, airframes, and engines. Research of these projects included over 150 interviews, from all management levels. While it is not LAI policy to publish the names of programs or companies, they did so with written permission. From results presented at LAI workshops, research focused on production programs or as Harris said, "where the real money is made."

LAI considered this a key area where there was room for the greatest improvement. Here the customer sees the largest part of procurement costs and contractors

might realize the best opportunity for a return on their investment.

Also important was limiting traditional worrisome areas of technology and funding uncertainty. The assumption is that systems in production have reduced technology, performance requirements, workforce, and budget uncertainties.

Findings

Comparing the findings, LAI discovered many common barriers. With both munitions projects, technical difficulties plagued production. Other factors such as cost overruns, schedule slip, acquisition reform-generated anxiety, and adversarial relationships were a problem. During the faculty forum it was noted these factors probably were not independent and fed off one another. From these facts, LAI noted a need to move from a status quo that nearly meant losing the program to one proactively designed for success.

Contractor

- Reasonable-Firm Government Commitment
- Reward for Accepting Additional Risk
- Enhanced Corporate Reputation
- Reduced Debt Service
- Government Assistance in Becoming More Lean
- Share in Cost-Reduction Savings.

Recommendations

For successful contracting, Harris and LAI noted that the status quo of perpetuating adversarial relationships and conflicting goals must immediately make way for a jointly beneficial environment where contractor and customer develop a joint cost model and negotiate contracts that meet mutual goals. Toward that end, the LAI recommends the following:

Customer and contractors jointly create shared goals in an environment of mutual respect, trust, and commitment.

By doing so, both sides let go of an "us vs. them" way of thinking and can better focus on shared goals. The first step, said Harris, is ensuring that information is shared openly between respective organizations.

Develop a Joint Cost Model (JCM) for the system in production, as appropriate.

Cooperative teams that utilize current information within known processes and tested technology can better identify procurement costs. LAI suggested using JCMs in all major defense acquisition

programs and that both customers and contractors be well-versed in the benefits of JCMs.

Customer and contractor negotiate the contract that meets mutually defined goals while remaining responsive to future uncertainty. With the cultural changes recommended by LAI, contractor and customer can negotiate contracts that meet both of their goals and needs. LAI specifically identified program managers using insight vs. oversight, being committed to a long-term relationship, and sharing the benefits and risks.

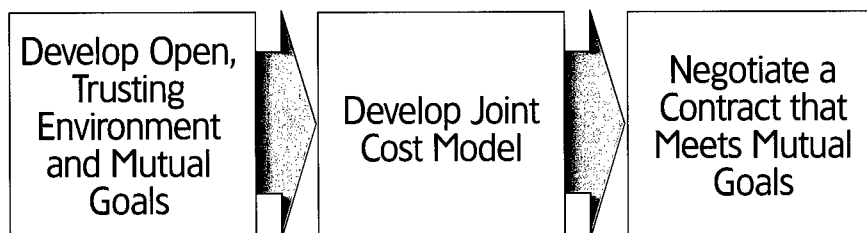
Successful Economic Incentives Result From a Chain of Events

Cultural change or common sense — playing on the same team, and fostering solidarity — breeds fantastic benefits.

"An open, trusting environment between customer and contractor could yield a number of tanks or missiles or aircraft or ships at significantly reduced price and related cost savings," said Harris. "An open, trusting environment is priceless. It is the only glue that can [bind] customer and contractor and produce a win-win outcome."

Editor's Note: Professor Harris welcomes questions or comments concerning this article. Contact him at weslhar@MIT.EDU. You may also view the thesis, case study, write-ups, and results briefing at <http://lean.mit.edu/lean>.

Successful Economic Incentives Result From a Chain of Events



KEY ENABLERS

- Leadership focus on meeting shared objectives
- Open sharing of information
- Recognizing mutual goals
- Development of a team identity
- Team members with the appropriate knowledge and skill set
- Long-term commitment

OSD UPDATES RULES OF THE ROAD

The Under Secretary of Defense for Acquisition, Technology and Logistics; and the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (C3I) recently published online a revised edition of the 1995 *Rules of the Road: A Guide for Leading Successful Integrated Product Teams*.

Designed to assist the Program Manager (PM) and supporting acquisition community in developing and executing high-performance Integrated Product Teams (IPT), this Oct. 1, 1999, update incorporates four years of experience the Department has gained in the IPT process. It also provides guidelines for more effective IPT operations.

In a memorandum to all PMs and IPT members, Dr. Jacques S. Gansler, Under Secretary of Defense for Acquisition, Technology, and Logistics described the Oct. 1 revision as "... a living document that facilitates organizing, leading, and participating in effective and efficient IPTs. The Director, Systems Acquisition, has updated this key guide, and I commend it to every PM and IPT member."

Editor's Note: To download an updated version of *Rules for the Road*, go to <http://www.acq.osd.mil/ar/#sat1> on the Defense Acquisition Reform Web site. For questions or recommendations to improve *Rules of the Road*, contact Dr. Joseph Ferrara, Deputy Director for Acquisition Systems Management, at (703) 614-5420 or E-mail Ferrarj@acq.osd.mil.

Leadership — Genetic or Learned?

An Informal Analysis of “Born to Lead” vs. Personal Effort, Tenacity, and Experience

BRAD MOHR

It has been said leadership is an innate quality — that either one is a leader or a follower. Leadership has been considered as more genetic than learned. It involves charisma and the force of personality. A natural leader will always emerge in a group, and followers will naturally fall in line behind a dynamic leader possessing the qualities of leadership. Alexander the Great or Gen. George S. Patton certainly fit this pattern of leadership, as do numerous other famous figures.

But there are other examples of leaders who did not come naturally to leadership. Some examples of leaders who have developed through personal effort, tenacity, and experience include Abraham Lincoln, Harry S. Truman, Sam Walton of Wal-Mart, and Gen. Ulysses S. Grant. These men were not born leaders, but worked to become leaders through hard work, vision, and purpose. They assumed leadership through sweat and effective goal setting. These individuals are examples of “educated leaders” who knew what they wanted and implemented a plan to succeed. They took action to achieve their goals.

Most people are not natural leaders, but as program managers, leadership is imperative to the success of a program. The program manager must inspire his team to achieve goals and ensure the team shares the vision. At the same time, the program manager must be able to energize the team to perform and imbue subordinates with a sense of purpose. The program manager is an organizer of

process as well as people. Being able to organize people so a definitive goal might be realized defines leadership more than any other factor. A leader motivates and achieves “buy-in” by subordinates. If one

is not a natural leader by default, then the only alternative is to become “educated” in leadership attributes and modify one’s behavior to assume those leadership qualities.



Mohr is Technology Manager, Program Executive Office-Intelligence Information Systems, U.S. Special Operations Command, MacDill AFB, Fla. He is a recent graduate of the Advanced Program Management Course (APMC 99-3), DSMC.

Many emerging program managers begin their careers as technical personnel and advance to positions of management. Once program managers, they are forced to assume the role as leader — they forsake the mantle of management of a process to assume leadership of people. They must rise above the process to become motivators. All program managers

thority to make decisions, knowing their leader does so with trust in their abilities. Leaders also proactively gather information and insist on productive results.

According to former Advanced Program Management Course (APMC) respondents, leaders have vision and are capable of taking risks; they are communi-

possibilities. A leader must be flexible and adaptable. A leader must be a practical risktaker, devoid of the fear of failure.¹

If an individual is not a “natural leader,” then what can someone do to adopt leadership qualities? According to Anthony Robbins, a renowned self-help lecturer, behavior modification is the key to change. Every individual is capable of change, providing the will to change is strong enough. Change is not a factor of thought — it is based on action. The desire to change will not produce results without behavioral modification.

The avoidance of pain or the search for pleasure prompts every human behavior. The behaviors or feelings that give us pleasure or satisfaction are instinctively fostered and nourished. Pain creates avoidance of behaviors or feelings that cause discomfort. How do we overcome the pain associated with behavioral change? Robbins says pain itself creates the environment for change. Behavioral change is possible when the pain of facing the results of ineffectual leadership is stronger than the reluctance to adopt new leadership approaches.

Robbins asserts that behavior changes when you “interrupt the pattern.” One must use other techniques to actually alter behavior. This requires an individual to recognize and acknowledge the “pain” associated with continuing unsuccessful behavioral patterns.

Adopting new behaviors cannot happen overnight, but must be nurtured on a daily basis. Behavior is based on “rituals” — we are used to reacting in certain ways based on experience or education. These “rituals” result in ingrained habits. The habits we acquire form the basis of our character and, ultimately, our destiny in life.

For example, people will feel they cannot trust the decisions of others. This results in a habit of never accepting the advice of others, leading to a pattern of micromanagement and a complete rejection of the principle of empowerment. The key to behavioral change is to “break

Leadership has been considered as more genetic than learned ... a natural leader will always emerge in a group, and followers will naturally fall in line behind a dynamic leader. Alexander the Great or Gen. George S. Patton certainly fit this pattern of leadership, as do numerous other famous figures.



must be strongly committed to the mission to succeed. They must look at the “Big Picture” and provide a method for achieving that end. Program managers must be systematic as well as innovative in their approach to mission achievement. They must select the appropriate personnel to support the program and empower those personnel with the au-

cators and possess people skills; and provide integrity as well as technical and program knowledge. Clearly, these attributes do not come easily to most individuals. We feel secure in treading the path of our past experience, feel uncomfortable entrusting to another those responsibilities we have in the past taken for ourselves, possess egos that prevent us from taking the advice of another, and find it difficult to open our minds to new

the pattern" and adopt different behaviors that mark true character change.

Behavioral change requires repetition. It is based on practice and the personal resolve to repeat actions one desires to acquire for the future. Only through the daily practice and personal application of leadership traits can the individual excel in positions of leadership. This conscious effort required to change becomes a desire with a specific goal as an end — to become a leader. Robbins states these desires become goals, and adherence to these goals "creates the future in advance," the "future" meaning success as a more effective leader.²

According to author Ken Blanchard, quality leadership is comprised of vision, productivity, innovation, intellectual curiosity, integrity, the knowledge of "leading edge" principles, and courage.³ All behaviors associated with these attrib-

utes of leadership can be learned and applied to daily actions. Robbins says the unwillingness to change or adopt behavioral patterns that result in ultimate success is predicated on fear — fear the action will result in failure, or that change itself is uncomfortable. Both instances cause pain, which, in turn, deters change.

But what are the results of a lack of leadership? For a program manager, ineffective leadership can mean a totally dysfunctional working environment and spells catastrophe for the program. The pain created by the management of an unsuccessful program due to ineffective leadership is felt by the program manager as well as everyone else on the team.

Avoiding the pain of failure is certainly more of a motivator than feeling the pain associated with behavioral change. Leadership does not require a precise genetic

trait; rather, it only requires the willingness to adopt positive attributes, through daily behavior modification.

Every leader requires courage. For program managers the courage to change is perhaps the most courageous act of all.

Editor's Note: The author welcomes questions or comments on this article. Contact him at (813) 828-2988 or mohrbe@gte.net.

REFERENCES

1. PM-711, *Program Leadership*, DSMC, 1999.
2. Robbins, Anthony, *Personal Power*, San Diego, Calif., Robbins Research International, Inc., 1993.
3. Blanchard, Ken and Brian Tracy, *How Leaders Lead*, Chicago, Ill., Dartnell Corporation, 1989.

Stan Z. Soloway, Deputy Under Secretary of Defense (Acquisition Reform), Office of the Under Secretary of Defense (Acquisition, Technology and Logistics) has directed establishment of the Change Management Center (CMC). In a Dec. 23, 1999, memorandum, Soloway:

- Directed that the CMC take the lead in accelerating acquisition and logistics reform initiatives, while providing a resource for change management across the Department.
- Directed the CMC to explore with the Defense Acquisition University adopting key attributes of the corporate university approach to provide education and training for the acquisition, technology and logistics workforce.
- Directed the CMC to pursue and incorporate where possible, cross-functional teaming across the Defense business enterprise to accelerate organizational goals and manage change.

The CMC will use rapid improvement activities to bring together diverse stakeholders within the Department, industry associations, and other partners. These rapid improvement activities focus attention on developing, implementing, and measuring new and innovative business practices while overcoming obstacles to acquisition and logistics reform. Moreover, the rapid improvement activities are based on a commercial methodology tailored for federal government applications.

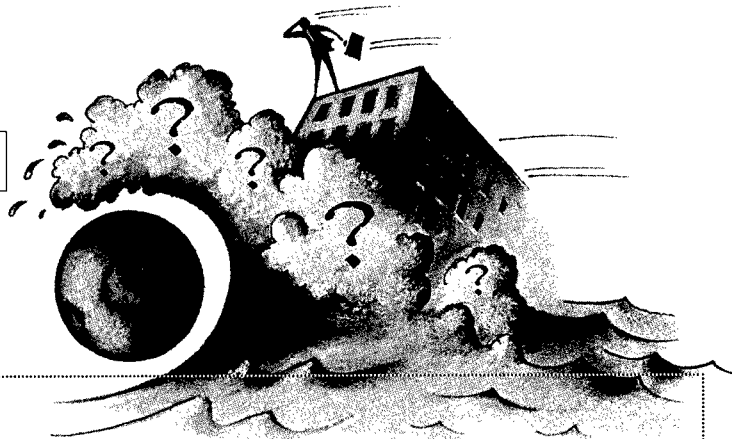
The lead for all CMC activity is William Mounts, Director, International and Commercial Systems Acquisition, (703) 614-3882 or E-mail mountsw@acq.osd.mil. Further information on CMC activities can be downloaded from the DUSD(AR) Web site at <http://www.acq.osd.mil/ar/cmc>.



ACQUISITION REFORM

An Internet Listing Tailored to the Professional Acquisition Workforce

Surfing the Net



DEPARTMENT OF DEFENSE

Under Secretary of Defense (Acquisition and Technology) (USD(A&T))

<http://www.acq.osd.mil/>
ACQWeb offers a library of USD(A&T) documents, a means to view streaming videos, and jump points to many other valuable sites.

Deputy Under Secretary of Defense (Acquisition Reform) (DUSD[AR])

<http://www.acq.osd.mil/ar>
AR news and events; reference library; DUSD(AR) organizational breakout; acquisition education and training policy and guidance.

Acquisition Systems Management

<http://www.acq.osd.mil/sa/asm>
Documentation, including Department of Defense Directives 5000.1 and 5000.2-R, Major Defense Acquisition Programs List, and more.

Director, Test, Systems Engineering & Evaluation (DTSE&E), USD(A&T)

<http://www.acq.osd.mil/sa/se/index.htm>

Systems engineering mission; Defense Acquisition Workforce Improvement Act information, training, and related sites; information on key areas of systems engineering responsibility.

Defense Acquisition Deskbook

<http://www.deskbook.osd.mil>
Automated acquisition reference tool covering mandatory and discretionary practices.

Defense Acquisition University (DAU) and Acquisition Reform Communications Center (ARCC)

<http://www.acq.osd.mil/dau>
DAU course and schedule information; consortium school links; documents, publications, and forms. ARCC provides acquisition reform training opportunities and materials.

Defense Acquisition University Virtual Campus

<https://dau.fedworld.gov>
Take DAU courses online at your desk, at home, at your convenience!

Army Acquisition Corps (AAC)

<http://dacm.sarda.army.mil>
News; policy; publications; personnel demo; contacts; training opportunities.

Army Acquisition

<http://www.acqnet.sarda.army.mil>
A-MART; documents library; training and business opportunities; past performance; paperless contracting; labor rates.

Navy Acquisition Reform

<http://www.acq-ref.navy.mil/>
Acquisition policy and guidance, World-Class Practices, the Acquisition Center of Excellence, and training opportunities.

Navy Acquisition, Research and Development Information Center

<http://nadic.nrl.navy.mil>
News and announcements; acronyms; publications and regulations; technical reports; "How to Do Business with the Navy"; and much more!

Naval Sea Systems Command

<http://www.navsea.navy.mil/sea017/toc.htm>
Total Ownership Cost (TOC); documentation and policy; Reduction Plan; Implementation Timeline; TOC reporting templates; Frequently Asked Questions (FAQ).

Navy Acquisition and Business Management

<http://www.abmrda.hq.navy.mil>
Policy documents; training opportunities; guides on areas such as risk management, acquisition environmental issues, past performance, and more; news and assistance for the Standardized Procurement System (SPS) community; notices of upcoming events.

Air Force (Acquisition)

<http://www.safaq.hq.af.mil/>
Policy; career development and training opportunities; reducing TOC; library; links.

Air Force Materiel Command (AFMC) Contracting Laboratory's Federal Acquisition Regulation (FAR) Site

<http://farsite.hill.af.mil/>
FAR search tool; *Commerce Business Daily* Announcements (CBDNet); *Federal Register*; Electronic Forms Library.

Defense Systems Management College (DSMC)

<http://www.dsmc.dsm.mil>
DSMC educational products and services; course schedules; *Program Manager* magazine and *Acquisition Review Quarterly* journal; job opportunities.

Defense Advanced Research Projects Agency (DARPA)

<http://www.darpa.mil>
News releases; current solicitations; "Doing Business with DARPA."

Defense Information Systems Agency (DISA)

<http://www.disa.mil>
Structure and mission of DISA; Defense Information System Network; Defense Message System; Global Command and Control System; much more!

National Imagery and Mapping Agency (NIMA) [Formerly Defense Mapping Agency (DMA)]

<http://www.nima.mil>
Imagery; maps and geodata; Freedom of Information Act resources; publications.

Defense Modeling and Simulation Office (DMSO)

<http://www.dmsomil>
DoD Modeling and Simulation Master Plan; document library; events; services.

Defense Technical Information Center (DTIC)

<http://www.dtic.mil/>
Technical reports; products and services; registration with DTIC; special programs; acronyms; DTIC FAQs.

Joint Electronic Commerce Program Office (JECPO)

<http://www.acq.osd.mil/ec/>
Policy; newsletters; Central Contractor Registration; assistance centers; DoD Electronic Commerce Partners.

Open Systems Joint Task Force

<http://www.acq.osd.mil/osjtf>
Open Systems education and training opportunities; studies and assessments; projects, initiatives and plans; reference library.

Government Education and Training Network (GETN) (For Department of Defense Only)

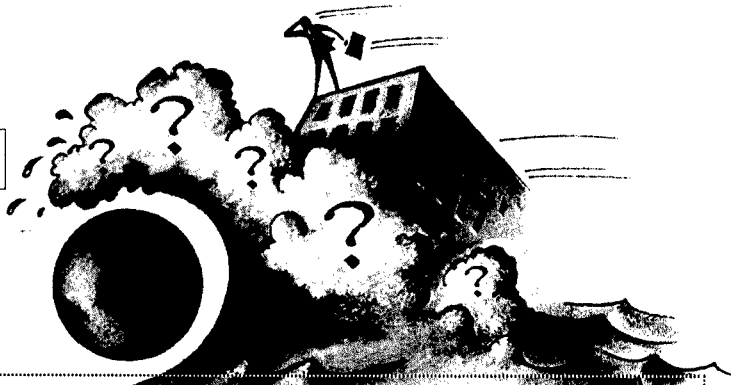
http://atn.afit.af.mil/schedule_page.htm
Schedule of distance learning opportunities.

Government-Industry Data Exchange Program (GIDEP)

<http://www.gidep.corona.navy.mil>
Federally funded co-op of government and industry participants that provides an electronic forum to exchange technical information essential during research, design, development, production, and operational phases of the life cycle of systems, facilities, and equipment.

ACQUISITION REFORM

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Surfing the Net

FEDERAL CIVILIAN AGENCIES

ARNET (Joint Effort of the National Partnership for Reinventing Government and Office of Federal Procurement Policy)

<http://www.arnet.gov/>

Virtual library; federal acquisition and procurement opportunities; best practices; electronic forums; business opportunities; acquisition training; Excluded Parties List.

Federal Acquisition Institute (FAI)

<http://www.faionline.com>

Virtual campus for learning opportunities as well as information access and performance support.

Federal Acquisition Jump Station

<http://nais.nasa.gov/fedproc/home.html>

Procurement and acquisition servers by contracting activity; CBDNet; Reference Library.

Federal Aviation Administration (FAA)

<http://www.as.faa.gov>

Online policy and guidance for all aspects of the acquisition process.

General Accounting Office (GAO)

<http://www.gao.gov>

Access to GAO reports, policy and guidance, and FAQs.

General Services Administration (GSA)

<http://www.gsa.gov>

Online shopping for commercial items to support government interests.

Library of Congress

<http://www.loc.gov>

Research services; Congress at Work; Copyright Office; FAQs.

National Partnership for Reinventing Government (NPR)

<http://www.npr.gov/>

NPR accomplishments and initiatives; "how to" tools; library.

National Technical Information Service (NTIS)

<http://chaos.fedworld.gov/onow/>

Online service for purchasing technical reports, computer products, videotapes, audiocassettes, and more!

Small Business Administration (SBA)

<http://www.SBAonline.SBA.gov>

Communications network for small businesses.

U.S. Coast Guard

<http://www.uscg.mil>

News and current events; services; points of contact; FAQs.

TOPICAL LISTINGS

MANPRINT

<http://www.MANPRINT.army.mil>

Points of contact for program managers; relevant regulations; policy letters from the Army Acquisition Executive; as well as briefings on the MANPRINT program.

DoD Acquisition Workforce Personnel Demonstration Project

<http://www.crfpst.wpafb.af.mil/>

Federal Register and Waivers Package; documents and briefings; reference material; operating procedures; FAQs.

DoD Specifications and Standards Home Page

<http://www.dsp.dla.mil>

All about DoD standardization; key Points of Contact; FAQs; Military Specifications and Standards Reform; newsletters; training; nongovernment standards; links to related sites.

Joint Advanced Distributed Simulation

(JADS) Joint Test Force

<http://www.jads.abq.com>

JADS is a one-stop shop for complete information on distributed simulation and its applicability to test and evaluation and acquisition.

Risk Management

http://www.acq.osd.mil/sa/se/risk_management/index.htm

Risk policies and procedures; risk tools and products; events and ongoing efforts; related papers, speeches, publications, and Web sites.

Earned Value Management

<http://www.acq.osd.mil/pm>

Implementation of Earned Value Management; latest policy changes; standards; international developments; active notebook.

Fedworld Information

<http://www.fedworld.gov>

Comprehensive central access point for searching, locating, ordering, and acquiring government and business information.

GSA Federal Supply Service

<http://pub.fss.gsa.gov>

The No. 1 resource for the latest services and products industry has to offer.

INDUSTRY AND PROFESSIONAL ORGANIZATIONS

Commerce Business Daily

<http://www.govcon.com/>

Access to current and back issues with search capabilities; business opportunities; interactive yellow pages.

DSMC Alumni Association

<http://www.dsmcaa.org>

Acquisition tools and resources; government and related links; career opportunities; member forums.

Electronic Industries Alliance (EIA)

<http://www.eia.org>

Government Relations Department; includes links to issue councils; market research assistance.

National Contract Management Association (NCMA)

<http://www.ncmahq.org>

"What's New in Contracting?"; educational products catalog; career center.

National Defense Industrial Association (NDIA)

<http://www.ndia.org>

Association news; events; government policy; *National Defense Magazine*.

International Society of Logistics

<http://www.sole.org/>

Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

Computer Assisted Technology Transfer (CATT) Program

<http://catt.bus.okstate.edu>

Collaborative effort between government, industry, and academia. Learn about CATT and how to participate.

Software Program Managers Network

<http://www.spmn.com>

Site supports project managers, software practitioners, and government contractors. Contains publications on highly effective software development best practices.

Association of Old Crows (AOC)

<http://www.crows.org>

Association news; conventions, conferences and courses; *Journal of Electronic Defense* magazine.

If you would like to add your acquisition or acquisition reform-related Web site to this list, please call the Acquisition Reform Communications Center (ARCC) at 1-888-747-ARCC. DAU encourages the reciprocal linking of its Home Page to other interested agencies. Contact the DAU Webmaster at darcc@acq.osd.mil